W. Ford

8503

The Well springe of SCIENCES,

Which teacheth the perfect worke and practise of Arithmeticke, bothe in whole Numbres and Fractions, set forthe by

HVMFREY BAKER, Londoner, 1562.

K

And nowe once agayne perused augmented and amended in all the three partes, by the sayde Aucthour, whereunto hee hathe also added certaine Tables of the agreement of measures, and waightes, of diuers places in Europe, the one with the other, as by the Table folowing it may appeare.

1574.

To the right worshipfull,

THE GOVERNOR, CONSULS, Asistentes, and the rest of the *Company of Merchantes aduenturers*: Humfrey Baker *Londoner, wisheth health, with continuall increase of commodity by their worthy trauaile.*

[illegible]

YF THE KNOWledge of Arithmetick (right worshipfull) were of so small proffitt in the life of man, or so little vsed in our wordlie affaires that it might be well lefte, or but seldome frequented, it were well doone by the professors thereof, to penne verie longe and eloquent orations in settinge forthe, and commendation of the same. But since experience hathe taught to bee trew the olde prouerbe: That where good wine is to sell, there neede no garlande be hãged out: me thinketh they doo greate iniury vnto Arithmeticke, that seeke to heare the cõ-

 moditics

modities thereof sette furthe in a shorte Epistle, and surely they ouercharge me in layinge suche a burden on my backe, as were to importable for the greatest Oratour. For the skil hereof is well knowen, immediatly to haue flowed from the wisdome of God into the harte of man, whome he hath created the cheife Image and Instrumente of his praise and glory, reuelinge himselfe vnto him so farre as hee iudged conuenient: whome notwithstanding he coulde not conceaue to remayne in the most secrete misterie of Trinitie in Vnitie: were it not by the benifite of most Deuine skill in Numbers, which skill, as also the most full and effectuall knowe-ledge of all other thinges vnspeakable, God vsed in his wonderfull creatiō of all the worlde out of nothing, whiche hee accomplished within the compasse of certaine nūber of daies: expressing moreouer what he made in euery day, and of certain his Creatures how many he made, as apereth

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in the booke of Geneſis, wroten by ſpeciall reuelation of the holy ghoſt, wherein the deuine Maieſty of God coulde not be knowen vnto vs without the knowledge of Numbers: nor Moyſes haue vnderſtoode what himſelfe had written. And Salamon the wiſeſt mā that euer was, conſidering the very depthe of all thinges within his minde, to whome God had geuen a greater gift of wiſedome, then to any man eyther before or ſince: doubted not to breake forth in theſe wordes, ſayinge: Thou O Lorde haſte diſpoſed all things in meaſure, numbre and waight, for thus it pleaſed him to iudge: who in another place teſtifieth, how that he hathe ſearched deeper (into the cauſes and knowe-ledge of all thinges) then any other man in the worlde. Theſe Teſtimonies (right worſhipfull) doo manifeſtly teache vs what wee ought to thinke of the cauſe, and Originall of Arithmeticke, and partely alſo howe neceſſary it is in the life of man, that

vnlesse by nature wee haue some feelinge and vnderstanding therein, we are no better thē Beastes, and in this respect worse, for that we retaine not that whereunto wee are as spectially borne, as naturally they doo, some to runninge, some to smellinge, some to hearinge, some to flying, and some to swimming. Take away Arithmetick, wherein differeth the Shepparde frō the sheepe, or the horsekeeper from the Asse? Surely but onely in shape and figure, whiche as the learned affirme, is a very slender cause of difference. VVherefore not without iust cause haue the auncient fathers, and Philosophers, singulerly extolled the knoweledge of Arithmeticke, diligentlye trayninge vp theire youth therein, as in a science most necessary of it selfe, considering the deepe deuises, the profounde practises, and cunninge conclusions therein conteyned: and also that it is thekey and entrance into all other artes and lear-

ninge:

ninge: as well approued the noble Philosopher *Pythagoras*, who caused this Inscription to be written (vpon his schoole doore where hee taught Philosophy) in greate letters, *Nemo Arithmeticæ ignarus hic ingrediatur*: Let none enter heere, that is ignorant in Arithmeticke: whiche sayinge, as it is proper and peculier vnto all sortes of mẽ, in the beginning and entrãce into all Liberall knoweledge and faculties to be ensued and embrased, so surely aboue all other, it is (next after the worde of God) most fitte and necessary that it shoulde bee written vppon youre schoole doores (right worshipfull) whose trade and trauaile is employed in the noble trafficque of Merchandise, wherein ye haue neede of continuall recourse vnto this excellent art. The dayly exercise whereof hathe so sharpened youre iudgements, and ripened your vnderstandings that most of you are become singuler therein, bothe to

deale that way youre ſelues, and to iudge of other mens doinges. And heerein I am ſure yee are good witneſſes with mee, howe fooliſhe and vayne is their opinion whiche beſide youre moſt commendable affaires, ſuppoſe and affirme that Arithmeticke is of ſmall vſe vnto any other men, ſeynge that the lawes of ſundry Realmes well inſtituted and guyded haue deſeruedly accōpted for fooles, and vnfitt members, (to rule or deale in a Common welthe) all ſuche as wanted the ſkill of naturall Arithmeticke, depriued them bothe of Landes and liuinge, whiche as it tendeth vnto no ſmall prayſe and credit of Arithmeticke: ſo am I conſtrained for breuitie ſake, in fewe wordes to ouerpaſſe both that, & others which might bee ſaide in commendation thereof. Shortly admoniſhing your worſhips, that wheras in times paſt, as is well knowen, I had trauelled in a booke in Engliſhe of that facultie,

dedicated vnto you: beynge now enforced to runne ouer the ſame, bothe amendinge and augmentinge it with ſundry additions: I am ſo bolde agayne to attempt youre worſhippes with the acceptation thereof, hopinge that as in fore time ye haue taken it ſuche as it was, ye will nowe alſo daigne to receyue it, beynge in better caſe (I hope) then euer it was: a token of my good will, howe be it a ſimple thinge, wherein you may weighe the harte and not the gifte, proceeding from ſuche a fountayne, that if better ſkill and knowledge had been matched to my good meaninge: it ſhould haue been done otherwiſe, to the better contentation of your worthines. And therefore in the meane ſeaſon, vntil it pleaſe God to furnishe mee in ſuche ſorte, I reſt in dayly prayer vnto him, to maynteine your felowſhip in happy eſtate and to bleſſe youre purpoſes with lucky ſucceſſe, to guyde youre voy-

ages

ages with wished encrease, and to season youre doynges with all kinde of vertue, and to preserue youre liues, with desired helthe to his will and pleasure.

At London, the 16 day of September. 1574.

A Prologue

A prologue to the gentle Reader.

HAuinge sometime now twelue yeares sithens (Gentle reader) published in printe, one Englishe booke of Arithmeticke, conteyninge as I suppose sundrie necessarye and profitable documents for suche as are willinge to attaine any knowledge therein. I haue bene often since that time, & of very late also, requested by sundrye of my freindes to peruse the same woorke, and as I should now iudge it expedient, to add sumthinge more ther vnto, and to amplefie the same. Which ernest and freindlye sute of theirs, for certaine iust causes seming nedefull vnto me, suerly I could in no wise deny. For when I perceaued the importunitye of certeyne straungers not borne within this lande, at this present, and of late daies so farre proceadinge, that they aduanced and extolled them selues in open talke and writinges, that they had attained such knowledge and perfection in Arithmeticke, as no English man the like: Truly me thought that the same report not onely tended to the

dispraise

dispraise our Countreymen in generall. But touched especially some others & me, that had trauailed & written publiquely in the same facultye. For vnto this same effecte they haue of late painted the corners and postes in euery place within this Citie, with their peuishe billes, makinge promise, and bearinge men in hande that they coulde teache the summe of that Science in breife Methode and compendious rules, suche as before their arriuall, haue not bene taught within this realme. Whose sayinges to bee false, and writinges vntrue: If I were therto required by men of aucthority, I am well able to proue, and that more is, (be it spoken without enuye, or thirst of praise) euen within this same booke, (if it maye please thee to make triall) are generall precepts & rules to be founde, such as they can bringe furth neither breifer nor better. But this is no rare thinge, since in other matters of greater importaunce, their attemptes are to to perilous, and their dedes outragious well deseruinge restrainct and banishment, againste one of whome, verilye not of mine owne accorde, but constrainedlye. I haue bene enforced to sharpen my pen, for that

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he (as I here ſay) cōtinueth in diſpraiſe of our nation , ſaying that we are vnſkilful in thoſe rules that he teacheth, & himſelf excelēt in the knowledg of Arithmetick wher in if true triall might be indifferent iudge: I doubt not but he woulde be found to haue the leaſt ſkill of a greate many. Of whome perhaps if I ſhould write vppon report of others I coulde ſay ſomewhat more, whiche would (if it were true and be knowen)redownd vnto his vtter diſcredit , which for this cauſe I omitt to do , leaſte the crime of arrogancie, might be thought to reſte with in me, which I obiect againſt him. How be it, this muche I dare affirme that there are diuers in this honorable Citye , who although they aduance and extoll not them ſelues(ſo malapertly) as theſe ſort of men are accuſtomed to dooe , in all that they profeſſe : yet do farre ſurpaſſe them as well in the knowledge of numbers, as in all other kinde of learninge, and ſkilfulnes. Another cauſe alſo there is of this preſent edition, as it ſemeth to me very iuſt , and neceſſarye. For when a certaine well willer of mine purpoſinge to employ ſometime in bettering his knowledge in Arithmeticke, throughe

the readinge of this present booke, did certifie me, that he in perusinge the same, had espied so manye errours committed in the imprintinge, that he could gather no truth therby. I was not a litle moued there at, since that by the disorderinge thereof, neither the worke retained his true meaninge neither could the reader attaine his desired knowledge. And surely no meruaile. for as I am credibly enformed, since it passed out of my handes, it hath bene oftentimes printed without the vew of a skilfull corrector onely throughe the procurement of an vnconscionable person seking rather his owne lucre, then the readers benifit, or the Authours honestie, and not weighinge how shamefull reproche redoundeth thereby, to the printer. These and such like considerations, vrging me forward, and not forgettinge the frute (louinge reader) that maye growe vnto thee hereby: I haue taken in hand both to amẽd and augment the same seasoning (as it were a fresh) all three partes of the worke, with diuers questions and Examples, very necessarye, and profitable: hauing also for thy commoditye, added vnto the ende of this booke, diuers and sundry

dry tables of the agrement of measures and waightes of sundrye places reduced to an equallitye the one to the other. Unto thee (therfore my request is thankefullye to accept the same, and in good part, wishing wel to him that trauaileth for thy benefiit, not disdaining it in respect of grosnes of the stile or rudenes of vtteraũce, since that this science requireth not eloquẽce of writing, but plaines of teachinge, and truth in working of diuers conclusions by numbers onely, desiring thee if thou be willing to profit hereby, first freindly to amend the faultes, that haue escaped in the printinge of the same and then to beginne at the entraũce of the booke, and so orderly proceading forwarde vnto the ende, not turninge vnto the myddest or last part therof, vntill thou perceauest well that whiche went before, and so doing thou shalt not onely attain to the perfect knowledge of the whole effect: But be able also by thine owne labour and industry to vnderstande all other bookes of Arithmeticke whatsoeuer, and thus I bidd the farewell hartely.

Here followeth the table of all that is contained in this booke.

The diffinition of number in Fol. 1.
The first Chapter treateth of Numeration. Fol. 1.
The second chapter treateth of Addition in whole number. Fol. 6.
The 3 chapter treateth of Subtraction in whole number. Fol. 10.
The 4 Chapter sheweth of Multiplication in whole number. Fol. 14.
The 5 Chapter sheweth of Diuision in whole number. Fol. 23.
And vnto all these are added their profes.
The 6 chapter is of Progressiō Arithmeticall, and Geometricall with questions of them both. Fol. 34.
The 7 chapter teacheth ẏ rule of three called the Golden Rule, and also the backer or conuerse rule of 3. Fol. 41.

The diffinition of nnmber.

NUMBER IS AS much to say as a multitude composed of many vnities, as two is composed of two vnities, three is composed of three vnities, foure of foure vnities, fiue of fiue vnities, ten of ten, fourtene of fourtene, fiftene of fifteene, twenty of twenty vnities. &c.

And therefore an vnity is no number, but the beginninge and originall of number, as if you doe multiplye or deuide an vnitye by it selfe, it is resolued into it selfe without any increase. But it is in number otherwise, for ther can be no number, howe great so euer it bee, but that it may continually be encreased by addinge euermore one vnitye vnto the same.

NVMERATION is ÿ arte whereby to expresse and declare the value of any summe proposed: and is of two kindes, the one gathereth the value of a summe proposed, and the other expresseth any summe conceaued by due figures and places, for the value is one thinge, and the figures are an other thing: and that commeth partly by the diuersitie of figures, but cheifly of the places wherein they bee orderly set. And therefore you must first marke, that there are but ten figures or characters whiche are vsed in Arithmetick, whereof nine of them are called signifyinge figures, & the tenth is called a Ciphar, whiche is made like an o, and of it selfe signifieth nothing, but if it be ioyned with any of the other figures, it increaseth their value, and these be they.

1	2	3	4	5	6
one,	two,	three,	foure,	fiue,	sixe,
7	8	9	0.		
seuen,	eyght,	nine,	a ciphre.		

Also

Also you shall vnderstande that euery one of these figures hath two values: One is alway certaine and hath his signification of his owne forme, and the other is vncertaine whiche hee taketh of his place.

A place is called the seate or rome that a figure standeth in, and how many figures soeuer are writen in one summe, so many places hath ye whole value thereof. And that is called the fyrst place (which is next toward the right hand) of any summe, and so reckeninge by order towarde the lefte hande, so that that place is last, which is next the lefte hand. And contrarywise, when you expresse the value of the fygures in anye summe, you must beginne at the left hand, and so recken toward the right hand. *A place.*

Euery of these nyne fygures, (which are called signifiynge fygures) hath his owne simple value when hee is founde alone, or in the first place of anye summe. In the seconde place toward the lefte hand, he betokeneth his

owne value ten tymes. As 70. is seuen tymes ten: that is to say seuenty. 80 is 8 times 10, ÿ is to say, eyghty. In the third place euery fygure betokeneth his owne value a hundreth tymes. As 700, in that third place betokeneth a hũdreth times 7, that is to say, seuen hundred. In ÿ fourth place euery figure betokeneth his owne value a thousand times. As 7000 is seuen thousand, & 8000, is eyght thousand. These foure first places must be had perfectly in minde yea & that by hart as they say, for by the knowledge of them you may expresse all kinde of numbers how great soeuer they be.

In the fift place euery fygure betokeneth his own value ten thousand times. As 70000, is ten times seuen thousand, that is to say seuenty thousande. In the sixt place euerye fygure standeth for his owne value, a hundreth M. times. As 700000, is seuen hundreth thousande. The seuenth place, M, M, times, or a milion. As 7000000, is seuen M, M, or seuen

milions. And the eyght place ten M, M, times, or ten milions: so that euery place toward the left hand, excedeth the former tenne tymes. But now for the easy reading, and redy expressing orderly of anye summe proposed, you shall practise this maner followinge. And for example I propone this number 765432658, in the which are ix. places. In the first place is 8, and betokeneth but eyght, that is to say once his owne value, in the seconde place is 5, and betokeneth ten times fiue, that is fiftye: in the thirde place is 6. and betokeneth and hundreth tymes sixe, that is vj C. In the fourth place is 2. and that is two M. And 3, in the fift place, is ten M times 3, that is xxx M. So 4 in the sixt place is C, thousande times 4, that is foure C, M. Then 5, in the seuenth place is a M, M, times 5: that is fiue M, M, or rather fiue milions. And 6, in the eyght place, is sixe times ten milions, that is lx. milions. And laste of all vij in the ix place, is vij C mili-

ons. Now followeth the practise. First put a pricke ouer the figure, and so ouer the seuenth, and likewise ouer the tenth. And also ouer the 13, 16, or 19. if you haue so many, and so still leauing two figures betwene euerye two prickes, and these roomes from one pricke to an other, are called ternaries, then you must pronounce euery thre figures from one pricke to an other, as though they were written alone from the rest. And at the ende of their value, adde so manye times a thousand, as your nūber hath prikes: (that is to say, if ther be but 1 prick it is but 1 M: if 2 pricks, one M, M: or else a milion, if 3 prickes, one M M M, or a M milions. And so consequētlye of all other figures folowinge). Then come likewise to the next iij. figures, and sound them as if they were a part from the rest, and adde to their value so manye times thousandes as there are prickes betweene them and the firste place of youre whole number. And so do by the next iij. figures follo-

Ternaries.

followinge, and all the reſt likewiſe: as in example 4 5 1 2 3 4 6 7 8 5 6 7, The firſte pricke ouer 8, in the fourth place, whiche is the place of a M. the ſeconde pricke is ouer 4, in the ſeuenth place, which is the place of a M, M, or one milion, the third pricke is ouer the tenth place, which is the place of a M, M, M. or of a M milio̅s as in the former example. Then for the expreſſinge of this number by the value of euery figure, according to the place wherin they ſtand, you ſhal fyrſt beginne at the laſt pricke ouer 1, and take it and the other two fygures 5, and 4, which are behinde the ſaide 1 towarde your lefte hande: and value them alone, and they are foure Cli, M M M, or elſe CCCCli, M milions. Then take the other three fygures from 1 to the next prick toward your right hand, and value them as if they were apart from the other, and they are 234 which do ſignifie CCxxxiiij milions, or 234 M M. Then come to

the thirde pricke ouer 8, and take the other two figures behinde it, and recken them likewise as if they were alone, and they are sixe Clxxviij M. And last of all come to the other three figures which remaine, that is 567: and they are fiue Clxvij. Thus the whole summe of these figures, is foure Clj. M. of millions two Cxxxiiij milions, sixe Clxxviij M. fiue Clxvij, as before.

Thre kindes of nūber.

Note also that whole number is deuided into three kindes, that is to saye, diget number, article number, and mixt or compounde number.

Diget.

The diget number, is all manner of numbers vnder ten, whiche are these nine figures, 1, 2, 3, 4, 5, 6, 7, 8, 9. of the which I haue spokē before.

Article.

The Article nūber is any kinde which hath in ẏ first place a Cipher, as this 0, and they may euer be deuided iust by 10. without any remayne, as these, 10, 20, 30, 40, 50, 100, and all other suche like.

Mixt or compound.

The mixte or compounde number cōteineth diuers and many articles, or at the least one article, and a diget, as

11, 12, 16, 19, 22, 38, 108, 1007. and so forth. And as any article number may be made a compounde, by putting thereto a diget, euen so likewise euery compounde number, may be made an Article number by addinge thereunto a 0.

And here foloweth a briefe rehersall of the order and Denominatours of the places. And this shalbe sufficient for Numeration.

The order of the places.		The denominatours of the places.
Tenthe.	4	M. of Millions.
Ninthe.	3	C. of Millions.
Eyght.	2	X. of Millions.
Seuenth.	1	Millions.
Sixte.	0	C. of Thousandes.
Fyfthe.	1	X. Thousandes.
Fourth.	8	Thousandes.
Thirde place.	3	Hundrethes.
Seconde place.	4	Tenthes.
Firste place.	5	Unities.

Addition in whole number.

Chap.2.

Addition is as muche as to bring together two sūmes or more into one, as if there were due to any man 223 li, by some one body: and 334 li, by another, and 431 by an other: and you would know how many pounds is due to ye same man in all, these three sūmes shal you set downe orderly the one vnder the other, writing the greatest summe highest, and the next to the greatest vnder it, and the least summe vnder the laste, in suche sorte that the first figure of the one summe toward your right hand be directly vnder the first figure of the other, and the seconde vnder the seconde, and so forth in order. When you haue thus done, draw vnder thē a straight line, and thē will they stande thus.

431
334
223

Nowe beginne alwayes at the first places towarde your right hande

hande, and put together the three firſt fygures of the firſt places of theſe thre ſummes, and looke what commeth of them, & write that vnder them beneath the line, as in ſaying 3, 4, and 1, beynge put togither doe make 8: write 8, vnder three, as heare you ſee.

4	3	1
3	3	4
2	2	3
		8

And then goe to the ſecond places of fygures & doe likewiſe: as in ſaying 2, 3, and 3, make 8, write 8 vnder 2, as here you ſee.

4	3	1
3	3	4
2	2	3
	8	8

And doe likewiſe with the fygures that be in the thirde place, in ſaying 2, 3, and 4 are 9, put nine vnder them, and ſo will your whole ſumme appeare thus: whereby you may perceaue that thoſe three ſummes beynge added togeather doe make 988 li. And this is the arte of addition according to his ſimplicitie, whē the ſumme of any place doth not exceede a diget number. But in caſe the ſumme of any one place cannot be

4	3	1
3	3	4
2	2	3
9	8	8

expreſſed

expressed by one figure, but by two, you shall put the first of those figures under the line, and keepe the other in your minde, for to adde it unto the firste figure of the next place. And if the same next place cannot be avalued but by two figures, you must in like manner put the first of those figures under the line, and reserue the seconde for the other place next after, and thus must you doe from one place to an other untill you haue come to the laste place, where if it happē you doe finde that the summe be of two figures, you must set them bothe downe bycause it is the ende of that worke, as in this example.

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 734682456
 450932345
  13467891
   4672123
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1203754815
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Where the first figures are 3, 1, 5. 6, whiche added together maketh 15.

for

for that, that 15 is of two figures, I doe put the first figure 5, vnder the line, & keepe the second figure (whiche is 1) in my minde, the whiche I must adde with the next figures of the seconde place, that is to saye with 2, 9, 4, and 5: the which together make 21. I write 1, vnder the line for the secõde fygure of that addition, that is to saye after 5: and I keepe 2, to be added vnto the third place, the whiche with the other figures 1, 8, 3 and 4. doe make 18: therfore I put 8, next after 1, in the third place vnder the line, & keepe 1 to bee added vnto the fygures of the fourth place, whiche is with 2, 7, 2, 2. the which with ẏ 1, that I keepe, do make 14: I set downe 4, for the fourth fygure (vnder the line) that is to say, behinde 8: and I keepe 1, to bee added vnto ẏ figures of the fift place, the which is 7, 6, 3 and 8. with the 1, that I kepe, maketh 25: I put 5 in ẏ fift place, vnder the line next after 4: & I kepe 2 in minde, to be added with the fygures of the sixt place, that is
with

with 6,4,9 and 6, and that 2, whiche I keepe, maketh 27: I write downe 7 vnder the line in the first place, and I keepe 2, which I adde with the fygures in the seuenth place, and they make 13: I put downe 3 vnder the lyne in the seuenth place, and adde 1 vnto the fygures in the eyght place, & they are 10: I do put 0 vnder the line in the eyght place, and then I adde 1 vnto the nynth place, that is to saye with 4 and 7. and they make 12: the which 12 I write at length vnder the lyne bycause it is the ende of this addition, and thus is to be donne of all such lyke. And for the easier vnderstanding of that which we haue spoken of addition, you maye examine these two other examples following in ye which the first hathe these numbers, 3570, 2763, 579, and 28: which being added togither, doe make this number 6940, and in the seconde example, doth result this nūber 51683, by adding togither of these numbers 47630, 3756, 272, 25, as here vnder written

written.

The numbers to be added.	3570	47630
	2763	3756
	579	272
The line put betweene.	28	25
The summe of this addition.	6940	51683

Addition of li. s. d.

But if I haue any summes, which are composed of diuers kindes of denominations, as 25 li. 17 s. 4 d, and 14 li. 13 s. 8 d, and 16 li. 19 s. 7 d. to be added together. I must first set downe all the sayd summes the one vnder the other, as here you see: placing the title of poundes right vnder ẏ pounds, the shillings vnder the shillings, and the penies vnder ẏ penies, keping likewise the

li.	s.	d.
25.	17.	4.
14.	13.	8.
16.	19.	7.
57.	10.	7.

dew order of their places, in eche denomination. And then I beginne at the least denomination, which are penies: And I say thus: 4 and 8 make 12, and 7 make 19 d: that is 1 s. & 7 d. I sette downe 7 under ye line agaynst the place of penies, and I doe kepe in my minde 1 s. to be added unto the place of shillings: This done, I procede to the sayd place of shillings saying, 1 s. that I keepe & 7 s. are 8, and 3 are 11, and 9 do make 20: I put 0 under the line agaynst 9, and do kepe 2 in my minde: Comming then unto the tens of shillinges, I say 2 that I keepe, and 1 make 3, and 1 make 4, and 1 make 5: whiche are 5 tens of shillings, that is to say 2 li. and 1 ten ouer, the whiche 1 I put behinde the 0 towardes my lefte hande under the tens of shillings, and I do kepe two li. in my minde, then I come to the place of poundes and say 2 li. that I kepe, and 5 are 7, and 4 are 11, and 6 doe make 17 li: I do set 7 li. under the line agaynst 6, and do keepe 1 in my

minde, then comminge vnto the tens of poundes, I say 1 that I keepe and 2 are 3, and 1 are 4, and 1 do make 5: the whiche 5 I write downe vnder the line behinde the 7: And so is this addition ended: And then yͤ sayd three summes beinge added together do amount to 57 li. 10 s. 7 d. And thus is to be done of all other summes, of any other denominations.

Other examples.

225.	12.	6.	5678.	13.	9.
47.	3.	9.	608.	00.	10.
38.	18.	7.	400.	17.	11.
5.	00.	8.	56.	18.	8.
			9.	12.	7.
316.	15.	6.	6754.	03.	09.

Of

Of Substraction in whole number.

The 3. Chapter.

Substraction teacheth howe you shall substract one lesser number from a greater, & sheweth what there doth remaine after that you shall haue substracted the same, I speake not of the substracting of one egall number, from an nother egall vnto it, for the facility thereof requireth no rule.

In substraction are found thre numbers, the one is the number, frõ the which the substraction is made. The second is the number ye is to be substracted, and the third is the number which remayneth after ye substraction is ended. As whẽ I would substract 25 from 40. The sayd 40 is the number from the which ye substractiõ is made, & 25 is the nũber to be substracted, and 15 is the number which re-

remaineth after you haue ended the substraction: here followeth ẏ practise. You shall put the lesser number vnder the greater in such sort that euery figure of the one number, maye aunswere vnto euerye figure of the other orderly according to their places, and then draw a right line vnder those two numbers as you did in addition. Then must you beginne at the right hande, and take the first figure of the vndermoste number and substract that from the first figure of the uppermost number ouer it, and that which remaineth you must set vnderneth the line righte vnder the figure which you haue substracted: then afterwarde take likewise the second figure of the nethermost number, and abate that also from the second figure of the higher number: the third from the third, and so forth of all the rest til you come to the ende, puttinge alwaies ẏ remaine of euery fygure vnder the line in his due order & place,

as by example. I wyll ſub- ſtract 2345, from 9876, af- ter ye I haue ſet them down according to the manner a- foreſaid. Thẽ beginning at	9876 2345 7531

the firſte place next to my right hand. I take firſt 5, from 6, and ther reſteth 1: ye which 1 I ſet vnder the line right againſt 5. Secondlye I ſubſtract 4, from 7, and ther reſteth 3: the ſayd 3 I ſet in the ſeconde place vnder the line next after 1. Thirdly I ſubſtract 3, from 8, & ther reſteth 5, the which 5 I put vnder the line in the third place next after 3. Finally I do ſubſtract 2, from 9, and ther reſteth 7: the which 7 I put vnder ye line in the fourthe & laſt place nexte after 5, and thus is this ſubſtraction ended in the which ther remaineth 7531.

But when two figures of one like- neſſe do chaunce to mete, ſo ye the one muſt be ſubſtracted from the other, as if I ſhoulde ſubſtract 7, from 7 there would remaine nothinge: then muſt I ſet a cipher 0, vnder the line. But

when the figure whiche is to be substracted doth excede ẏ figure which is ouer him, so that it cannot be taken out of the same figure. Thē must you substract the vndermoste figure from 10, and ẏ which dooth remaine, you shal adde vnto the same figure which is vppermost. And the summe which resulteth of them both you shall sette vnder the line. But whensoeuer you do borrow anye suche 10 of the ouer number: you must adde 1 vnto ẏ next nethermost figure followinge which is yet to be substracted. And there is nothing else to be done in substractō. Exaumple, I will substract 93576, from 4037479, after that I haue placed my two numbers as I ought to do, I do firste substract 6, from 9 & ther resteth 3, then I put the 3 vnder the line right vnder the 6. And secondly I substract 7 from 7, and there resteth nothing: I do therfore put a cipher 0 vnder the line right against 7 in the second

4037479.	
93576.	
3943903.	

seconde place. Then I come to the thirde place where I find 5, which I cannot substract from the figure ouer him, which is but 4, therefore I doe substract it frō 10: as before I taught and there resteth 5, the which I doe adde with the 4 which is ouer him, & that maketh 9: I put 9 in the thirde place vnder the line for the thirde fygure. Fourthlye, for the 10 which I borrowed I adde 1 vnto the nexte figure which is to bee substracted, whiche is 3, and they make 4: the saide 4 I doe subtracte from the ouer fygure 7, and there resteth 3, I put 3, vnder the line for the fourth figure. And thē I come to the fift place wher I do finde 9, which I cannot subtract frō the figure ouer him, which is but 3. but I doe substract 9 from 10, and there resteth 1; the whiche figure 1 I do adde with 3, and they make 4: I put 4 vnder the line for ẏ fifte figure. And heere is to bee noted ẏ if it were not for ẏ I did at the last borrow 10, the substraction should haue bene en-

ded. But for bycause that I must (for euery such ten that I borrow, alwaies adde 1 vnto the next lower figure following, I must therfore procede vnto the substraction. And for bycause ye there is no other figure followinge in the lower number, it shal suffice to haue kept the vnitye and to substract it from the next ouer figure. But I finde there 0, and therefore I cannot substract 1 frõ 0, therefore I substract it from 10, and ther resteth 9: which I do put vnder the line in the sixt place: finally for the ten which I borrowed, I kepe 1 in minde: The which I doe abate from 4, and there remaineth 3, the which 3 I do put vnder the lyne in the seuenth place after 9, and the operation is thus ended.

An other example.

$$\begin{array}{r} 576084026 \\ \underline{485675437} \\ 90408589 \end{array}$$

But if there were many numbers to be substracted from one number alone, then muste you fyrst adde those

numbers

numbers togither according vnto the instruction of the chapter goinge before, and afterward to make your subſtraction as aboue is ſaide. As if I woulde ſubſtract theſe three ſummes 123, 234, 456, from 98925: firſte I doe adde the three ſummes into one, & they are 813. The which I doe ſubſtract from 98925, and there reſteth 98112.

But if the ſummes be compoſed of diuers kindes of denominations, thē you muſt beginne at the leaſt denomination next toward your right hand, and ſo ſubſtract euery denomination frō his like yf it may be ſubſtracted, yf it cannot be ſubſtracted, thē you muſt borrowe 1 of the next denomination toward your left hand, and reduce the ſame into the like denomination of that figure whichis to be ſubſtracted, then ſhall you ſubſtract youre firſt or leaſt denomination, from ẙ ſaide ſum ſo borrowed, and that figure or number that ſhall remaine, you muſt adde with the vpper mooſt number of the

leaſt

least denomination, and set the aggregate vnder the line right against his like. Then the 1 which you did borrow must be added with the next figure of ye next denomination yt is to be substracted, and so to procede with the whole sum that is to bee substracted.

Example.

I would substract 15 li. 17 s. 11 d. from 28 li. 13 s. 9 d. I doe first put down ye great summe, and vnder that the lesser with a line vnder thẽ as heare you see, and then I doe beginne at the least denominatiõ which are penies, wher I say 11 penies from 9 penies, I cannot. And therfore I doe borrow 1 s. of the next denominatiõ that is of the 13 s. the which 1 s. is 12 penies: Then I substract 11 penies from 12 penies, and there remaineth 1 peny, the whiche 1 peny I doe adde with 9 penies, and they make 10 penies: the said 10 I set vnder the line and do keepe the 1 s, in my minde yt I borrowed

li.	s.	d.
28.	13.	9.
15.	17.	11.
12.	15.	10.

borrowed, then I come to the ſecond denomination of ſhillinges, where I do finde, 17 s. then I ſay 1 s. ye I borrowed and 17 doe make 18 s: the ſaid 18 s. out of 13 s. cannot be: therfore I do borrow 1 li. of the next denomination, that is to ſay out of the 28 li. and the ſayd 1 li. are 20 s. then I ſubtract 18 s, from 20 s. and there remayneth 2 s. with ye which I doe adde the 13 s. and they do make 15 s: the ſame 15 s. I ſette vnder the line, and I do keepe 1 li. to be added to the lower place of poundes: then I ſay 1 li. that I kepe, and 5 are 6: I ſubtract 6 li. from 8 li. and there remayne 2, I ſet the ſayd 2 vnder the line agaynſt 5: and laſt of al, I come to the tens of poundes where I doe finde 1, then I do ſubtract that 1 from 2, & there remayneth 1: which I ſet vnder the line, & ſo I finde there remayneth 12 li. 15 s. 10 d. and ſo is to be done of all other like.

Of

Of Multiplication.

Chap. 4.

IN Multiplicatiõ ther are iij. numbers to bee noted, that is to saye the numbre which is to be multiplied, the which wee will cal the Multiplicande: the seconde is the nũber by ẏ which we do multiply, which we will name the multiplyer, or multiplicatour. And the thirde number is that whiche commeth of the multiplication of the one by the other, whiche is called ẏ product. As when I would know how much amoũteth 10, multiplied by 9, that is to say how muche are ten times nine. I finde that they are worth 90. then 10 is the multiplicand, and 9 is the multiplyer, and 90 is called the product. So that to multiply, is none other thing, but to finde a number which conteyneth the multiplicande so many times, as the multiplier conteyneth vnities: As 10, multiplyed by 9, doe make 90 as be-

fore

fore is saide. And 90 cõteyneth 10 so many times, as 9 conteyneth vnities, ỳ is to say nyne tymes.

In multiplication, it forceth not much which of the two numbers bee the multiplicande, nor which bee the multiplier. For 10 multiplied by 9, maketh as manye as 9 multiplied by 10, yet neuerthelesse it shall be more commodious that the lesser number be alwaies the multiplier.

And for that, that the multiplication of fygures the one by the other, is the chiefe & necessariest kynde whereby to know how to worke in the multiplication of compound numbers, and ỳ euery mã hath not the same at the fingers ende, I will therefore giue you here certaine easye waies of multiplication of diget numbers. when you would multiply two simple figures, or digets ỳ one by the other, substract each of those dyget numbers from 10. Then multiply the two remaynes the one by the other, and if the summe do excede 10, write onely the first figure

and

and kepe the other to bee added to the next operation, which is thus as followeth. Add your two simple figures togither: & of ye which resulteth of the additiõ, take onely ye first figure, vnto the which you must add ye vnity which you did kepe before. And yt shal be the secõd figure of ye summe which you do seke. Example. I would multiply 7, by 6, I take 7 from 10, & ther resteth 3: likewise I substract 6 from 10, and there resteth 4, thẽ I say thus, 3 times 4, make 12: I write 2 for my first figure, & I kepe 1 in mind: then I adde 6, with 7, & they are 13: of the which I cast away the second figure toward my left hand which is 1: and I take onely the first fygure 3 which is towarde my right hand, vnto the which I adde ye vnitie which I kept, & they make 4, which I write in the seconde place, after 2, & thus I find 42 which is the valure of 7, multiplied by 6.

Otherwise, and al commeth to one effect: set downe your two diget numbers the one right ouer the other, and right

right agaynst euery of them towarde the right hande write his owne difference from 10: Then multiply yͤ two differences together, the figure which commeth thereof, shall you set downe vnder both the differences if it be a diget number, that is to say, any nũber vnder 10. But if there be two figures, set downe but the firste, and keepe the other in your minde, afterwards subtract (from one of the two diget numbers) that were first set downe, yͤ differẽce of the other diget number, that is to say, crossewise. And vnto the remayne adde yͤ figure which you kepte before: and that shalbe yͤ second number, & thus you shall haue your multiplicatiõ. Example of yͤ same figures that is to say of 7, multiplyed by 6, the difference of 7 from 10, is 3: And the difference of 6, from 10, is 4: I set them downe crosswayes as you see: And then I say three times foure are 12: I set downe

downe 2 and keepe 1 in my minde, then I subtract 4, from 7, or else three from 6. it forceth not from whiche of them, and there resteth alwayes 3: unto the which I adde the unitie whiche I kepte in my minde, and they are 4, which shalbe the seconde figure of the multiplication. And thus I finde that 7, multiplyed by 6, maketh 42: as in the other operatiõ. This practise hath no place where the 2 diget numbers (doe not exceede 10,) by adding them together, and then is multiplication easy ynough without any rule.

Another way to know the multiplication of simple numbers, is by thys table followinge: the use whereof is thus.

Fyrst you shall understand that the numbers frõ 1, & so descending downwardes to 9, which are set in the lefte part or hanging margine of this table doe betokẽ the multipliers of all simple numbers. And the elements or figures beinge putte highest, in euerye square rome drawinge towarde your

right

right hande right against euery of the multiplyers, do signify the multiplicands, which do appertaine vnto the multipliers of the hanging margine. And ÿ lower or inferior numbers in euerye square roome, do betoken the product of that multiplicatiõ, which is made in multiplying the vpper number ouer it, with the fygure in the hanginge margyn, answerynge dyrectly vnto the sayd square: as by example.

The Table of Multiplication by all the Diget numbers.

1	1 1	2 2	3 3	4 4	5 5	6 6	7 7	8 8	9 9
2	2 4	3 6	4 8	5 10	6 12	7 14	8 16	9 18	
3	3 9	4 12	5 15	6 18	7 21	8 24	9 27		
4	4 16	5 20	6 24	7 28	8 32	9 36			
5	5 25	6 30	7 35	8 40	9 45				
6	6 36	7 42	8 48	9 54					
7	7 49	8 56	9 63						
8	8 64	9 72							
9	9 81								

First bycause 1, doth not multiply, I haue set in the vpper margin the figures from 1, to 9: both in the higher and also in the inferior rowes, for 1, in the hanging margine, multiplyed by 1, the vpper nūber in the firste square bringeth but 1. So likewise 2, beynge the higher number in ẏ second square, of the vpper margine, multiplyed by 1 in the hāging margin, bringeth 2 for the lower number in the second square of the vpper margine: For 1 times 1, maketh but 1: And 1 times 2, maketh 2. Thē 1 times 3, maketh 3: And 1 times 4, maketh 4: And so continuing towarde the right hande vntill I come to ẏ figure of 9, which is 1 times 9, maketh 9. Then afterwards I multiply 2 of the hanginge margin by 2, whiche is the vpper number of the square next toward the right hande, & that maketh 4 which is ẏ product of 2, multiplied by 2, that 4 I set vnder the 2, for 2, times 2 are 4: and 2 times 3 maketh 6: then 2 times 4 maketh 8, and 2 times 5 maketh 10, and so con-

continuing vnto 2 times 9, which maketh 18. The like is to be donne with the third row, and so likewise of all ye residue.

Example, I woulde know what is the product of 9, multiplied by 8. I seke in ye hāging margin ye multiplyer 8, and amōgest the squares directly against 8, drawinge towarde the right hand, I seke the multiplicand 9, in the higher row, and I find the producte right vnder 9, to be 72: Then 72, is the number whiche commeth of the multiplication of 9, by 8. And so is to be vnderstanded of all the rest of the table. which table must be (of all men) learned by hart, or as they say without booke: which beynge learned you shall the better attaine to the rest of multiplication.

To come now vnto the practise of multiplication, when you would multiply two numbers, the one by the other, you must set them downe after ye same manner as you did in addition, and in subtraction. That is to say, the

fyrst

first figure of the multiplier vnder the fyrst fygure of the multiplicande, the seconde vnder the second, & the thirde vnder the third, if ther be so manye, & then drawe a right line vnder them, as in the other operations goinge before. After this you shall multiply all the figures of the multiplycande by the multiplyer, and sette downe the fygures (comming of any such multiplication) vnder the lyne euery one in their dew order & place.

Example, I would multiply 123 by 3, that is to say, I would know howe much amounteth thre times one hundreth, twenty and thre. The two numbers beynge placed in suche order as is before saide, you must begynne towardes ye right hand: and say thus, 3 tymes 3 are 9: write downe 9 vnder the line, right against 3, for ye first figure: secondlye by the same 3, you must multiply the second figure 2, & they make 6, put downe 6 after the 9 vnder the lyne: Thirdly by the same 3 you

123
3
369

3, you shall multiplye the last fygure 1. and they are but 3, set downe 3 after 6 for the third and last figure. And thus is the worke ended: wherby you shall finde, that 123 beyng multiplyed by 3 maketh 369.

But when it happeneth that of the multiplication of one figure by an other, the summe which commeth therof shalbe of two figures, as it happeneth often, then shal you write downe the first figure, and keepe the other figure to be added vnto the multiplication of the next figure,

Example. 6 men haue gayned (euery one of them) 345 crownes, I woulde knowe howe many crownes they had in al. First I multiplye 6 by 5, they make 30. I write 0, vnder ye line, and for 30 I doe keepe 3 to be added to the next multiplication: Secondly I saye 6 times 4, are 24: vnto the whiche I adde 3, whiche before I reserued: And they make 27. I write 7 in the second place

$$\begin{array}{r} 345 \\ 6 \\ \hline 2070 \end{array}$$

vnder

vnder the line, and I kepe 2, to be added to the next multiplicatiō: Thirdly I saye 6 times 3 are 18, vnto the whiche I adde the 2 whiche I keepe, and they make 20, the whiche I write all downe for bycause that is the laste worke. And so I finde that 345 beyng multiplyed by 6, do make 2070. But when the multiplyer is of many figures, you must multiply al ẏ whole multiplicāde by euery one of thoſe figures, & write the products euery one orderly vnder his owne fygure.

Exaumple. I woulde knowe howe many dayes are past from the natiuity of Jesus Christe vntill the yeare 1560 full complete. I must now multiply 1560, by 365 dayes: bycause there are so many dayes in one whole yeare. The leape yeares not beynge reckened, whiche haue euery one of them 366 dayes.

Therfore first by the figure 5: I multiply all the higher figures saying thus, 5 times 0, ma-

$$\begin{array}{r} 1560 \\ 365 \\ \hline 7800 \end{array}$$

keth o: I write o, vnder the line for the first figure, and bycause I keepe nothing for the next place, I proccede and say: 5 times 6 are 30: I set o vnder the line for the second figure, and I kepe 3 to be added to the next multiplication: Thirdely I say, 5 times 5 are 25: The whiche with the 3 that I keepe are 28: I set downe 8 for the thirde figure, and keepe 2 to be added with the next multiplication: Then comming vnto the fourth and laste figure, I say 5 times 1, are 5: the which withthe 2 that I reserued are 7: I put 7 for the last figure of this first worke by the figure 5: with the which figure I haue no more to doe. And therfore I cancel the same ~~5~~ with a little strike thorow it, to signify that I haue finished with ye figure. And for as muche that in multiplycatiō ther is alwaies as manye simple operations, as the multiplier conteyneth figures There resteth yet 2 works to be made. I cōe therfore vnto the second worke which is ye figure 6, by ye which I must again muliply all the figures of the multi-

plicande as I did by 5, and the first figure (which shalbe produced) I doe put one ranke more lower than yͤ fygures of the worke now last made by 5: not right vnder yͤ first fygure of the multiplier 5, but vnder 6: that is to sai one degre or place nerer towarde the left hande: & one rancke more lower than the fyrst worke: and I must put afterward euery of the other fygures which commeth of the same multiplicatiõ in their order: thirdly I do make the multiplication by the third figure, & that which shall come therof I must set in his ranck, as here after shal appeare. And now I nede make no further discourse hereof, bycause that he which can doe the fyrst multiplication by 5, may as easely doe all the others. It shall therfore suffice to set here vnder yͤ examples of al yͤ 3 sũdry works.

	1560	1560
1560	65	365
5	7800	7800
7800	9360	9360
	101400	4680
		569400

Nowe, if you will knowe howe muche all the three workinges thus placed, do amount vnto, which in value must be but one number: you must adde all the numbers which are come of all the 3 multiplications together, but not after the same maner as wee haue done in the chapter of addition, the first fygure of the first ranck with the first figure of the seconde ranck, & so of the thirde: but you muste adde them in the same sort as you shal finde them situated and placed: that is to say, the fyrst fygure of the fyrst rancke alone by it selfe: the seconde of yͤ fyrst ranck with the fyrst of yͤ second ranck. The third of the fyrst rancke with the seconde figure of the seconde rancke, and wͭ the first of yͤ third ranck: & so of al yͤ other as hereafter doeth appeare.

And thus the 1560 yeares doe contayne fyue hundreth sixtye & nyne thousande foure hundreth dayes, not countinge herein the dayes

	1560
	365
	7800
	9360
	4680
	569400

dayes of the leape yeares, whiche are here in number 390. for then ỹ whole sũme of the dayes should be 569790.

An other exaumple.

```
     34560
      2456
   -------
    207360
   172800
  138240
   69120
  --------
  84879360
```

The summe of multiplication is thus, when you woulde multiply any number by 10, you shal onely put one cipher 0 before all the numbers, that is to say a degre neerer ỹ right hand. as 345 multiplyed by 10, maketh 3450. yf you wyl multiply any nũber by 100. Adde vnto ỹ same nũber two ciphers thus 00, if by 1000 add 000. And to be breife when the last fygure of the multiplier is 1 and all the rest be ciphers, adde so manye ciphers to youre multiplycande, as there shall be

fold ciphers in your multiplier. But if in my multiplyinge, the last fygure were not 1. but that there were onely certaine ciphers in the beginninge: & that the other were signifyinge fygures, and likewise those of the multiplicand, then shal you put those ciphers apart, and multiply the signifyinge fygures of the one by the signifiyng fygures of the other. Thē adde unto the product of that multiplycation, all the ciphers which you did before put aparte. As if I would multiply 46000, by 3500. I put a part the three ciphers of the first, and the two cyphers of the second numbers which are in all 5 cyphers 00000: And then I multiply 46 by 35, and therof commeth 1610: Before the which, toward the right hand, I adde the 00000 that I did put aparte, and then the whole product wilbe 161000000.

$$\begin{array}{r} 46 \\ 35 \\ \hline 230 \\ 138 \\ \hline 161000000 \end{array}$$

Of diuiſion.

Chapter 5.

Diuiſion or partition is, to ſeke how many tymes one number doth conteyne an other, or els how often tymes one number may be founde in an other, for in yͤ worke of diuiſion there are required two numbers, to be fyrſt knowen, for the fyndinge oute of the thirde. The fyrſt number knowen, is called the diuidend or number whiche is to be diuided, & that muſt be the greater number, the ſeconde number is called the diuiſor, and that is the leſſer. And the thirde number whiche I doe ſeeke, is called the quotient. As if I would diuide 36 by 9, the diuidend ſhall be 36: and the diuiſour is 9. And forbycauſe that 9 is conteyned in 36, foure times, that is to ſay, 4 times 9, doe make 36: The quotiente ſhall bee 4, as yf you marke wel, how many times 9 is cō-

teyned in 36, you shall fynde yt 4 times: and therfore 4 shalbe ye quotiēt.

The practise.

Wryte downe fyrst the diuidende in the higher number, & the diuisour underneth, in suche sorte, that the fyrst fygure of the diuisour toward the left hande, be vnder the fyrst fygure of the diuidend, & euery fygure of ye same diuisor vnder his lyke, that is to say, the fyrst vnder the fyrst, the seconde vnder the seconde, the thirde vnder the third, and so consequentlye of the other, yf there be so many, whiche is contrary to the other three kindes before specifyed, but yet you must cōsider further, yf all the lower fygures of the diuisor, may be taken out of ye higher fygures of the diuidend, by the order of subtraction or not. The which yf you can not do, then must you set ye fyrst fygure of the Diuisor (towarde the lefte hande) vnder the seconde fygure of the diuidend, and so consequently the reste in theire dewe order, yf any be to bee set

downe, euery one of them vnder his lyke, as before is sayd. And then draw a lyne betweene the dyuidende and ẏ dyuisor. And at the ende of them an other crooked lyne, behinde the whiche towarde the righte hande, shall be set youre quotient. As by thys exaumple folowinge, where the dyuisor is but of one fygure.

If you would deuide 860, by 4, you must set downe 4 vnder the 8 with a line betwene them, as here vnder you may see.

The diuidende.	860
Diuisor.	4

And then you must seke how many tymes the diuisor 4 is conteyned in ẏ higher nūber that is to say in 860, the diuidende aunswerinige to him, as in this our example I must seke how manye times 4 is conteyned in 8, in the which I finde yt 2 times, then I write downe 2 apart behind the crooked line as here you may se, which shall be the first fygure of the quotient to come, secondlye by thys fygure 2 (beynge

thus

thus put apart) I muſt multiply the diuiſor 4: and vnder the ſame multiplicatiõ. I muſte ſet that number which cõmeth of the ſame multiplycation as 2 times 4 do make 8, yͤ which 8 I doe ſet vnder the diuiſor 4, Thirdly, I doe ſubtracte the producte of the ſayde multiplycation (of the quotient by yͤ diuiſor) yͭ is to ſay 8 from the higher number correſpondent to the ſame, in ſayinge 8 from 8 ther remayneth nothing, and then I cancell or ſtryke out that which is done as you ſe. In theſe three operations and workes is comprehended the arte of diuiſion. The which are to be obſerued from poynt to poynct, for ther is no diuerſity in yͤ fyniſhinge of the ſame which is thus.

$$\begin{array}{l} \cancel{8}\ 6\ 6 \\ \hline \cancel{4}\ \ (2 \\ \cancel{8} \end{array}$$

Now ſecondly I muſt remoue my diuiſor one place nerer towarde my right hãd, as in procedinge with our exãple. Here you ſe I remoue my deuiſor 4, which was vnder 8, and I ſet it vnder 6, then I ſeke howe many

$$\begin{array}{l} \quad\ \ 2 \\ 8\ \cancel{6}\ \cancel{6}\ (21 \\ \hline \quad 4 \end{array}$$

times

conteyned in 6: where I fynde it but one tyme, then I set 1 behinde the croked line next vnto the first fygure of yͤ quocient 2, a degre or place nerer my right hand, afterward by this last and new figure 1. I multiply the diuisor 4, & that maketh but 4 (for an vnitye whiche is but 1 encreaseth nothinge) I abate therfore 4 from the higher figure 6, and there resteth 2 the whiche 2, I set ouer the 6: and I cancel the 6, for so must I do when there resteth any thinge after I haue made the subtraction. Thirdly for asmuch as there yet remayneth another fygure in the diuidend, I remoue againe the diuisor, and I set it vnder yͤ cipher 0. Thē I seeke how manye times 4 is in the higher number which is 20, where I may find it 5 tymes, I put therefore 5 behinde the croked line for the thirde and last fygure of yͤ quotient. Then by the same 5. I multiplye yͤ diuisor 4 and yͭ maketh 20, the which 20 I a-

$$\begin{array}{l} \;\;2 \\ \cancel{8}\cancel{6}0\,(215 \\ \hline \;\;\;4 \\ \;\;\cancel{2}\cancel{0} \end{array}$$

bate from the higher number, & there resteth nothing. And so is this diuisiō ended: and thus I haue found ẏͭ 860, beinge deuided by 4 bringeth for the quotient 215: that is to say, that 4 is conteyned in 860, two hundreth & fiftene tymes. Thys is the most easiest workinge that is in diuision, but that which followeth, apperteyneth to the whole and perfect vnderstandinge of the same. when the firste fygure of your diuisor towarde your left hand, is greater than the fyrst of ẏͤ diuidend, you must not place the fyrst fygure of your diuisor right vnderneth the fyrst of the diuidend, but vnder the second fygure of the same diuidend, nerer to youre righte hande, as before is saide. Therfore whē ẏͤ diuisor is of many figures and ẏͭ you haue to seke how many times it is conteyned in the higher nūber (for the more easier working) you must not seke to abate the diuisor at one time, but you must see and marke how many times the fygure of the same towarde the left hand is conteyned

teyned in the higher number aunswe-ringe to the said number, and then to worke after the same maner as is be-fore taught.

Example, I haue 316215. crownes to be deuided among 45 men, and for to make my diuision I must not put the fyrst fygure of the diuisor which is 4, vnder the fyrste of the dyuidende, whiche is 3, bycause that 4 is greater number than 3. And further, you know that, I cannot take 4 out of 3. wherefore I must set the 4, vnder the seconde fygure of the hygher number that is to say, vnder 1, and the fygure 5, of the diuisor, right vnder the 6, as here you may see.

So that I must fyrst seeke, how manytimes 45, is cōteyned in 316, whiche is but parte of the diuidende. wherefore for the more easie working I neede but to seeke how many times 4, is conteyned in 31. And bycause I may haue it 7 tymes, I put 7 behinde the crooked line, as is aforesayd: then

3	1	6	2	1	5
	4	5			

by 7, I multiply al the diuiſor 45, and they are 315: the whiche I ſet vnder yͤ ſame diuiſor, the fyrſte fygure vnder yͤ fyrſte: and the other in order towarde the lefte hande. Then I ſubtract 315, from the higher number 316: and of thys fyrſt workinge there remayneth but 1, the whiche I ſet ouer the 6, and I cancell likewiſe the 315, and the other fygures 316, and alſo the diuiſor 45: and then it will ſtande thus, as in the margent.

1
~~316~~215
~~45~~ (7
~~315~~

And when I come to remoue the diuiſor, and that I muſt ſeeke howe manye times it is conteyned in the higher number, if I ſee that I cannot finde it there, that is to ſay, that if the higher number be leſſer than the diuiſor, as it is in this example, then muſt I put a cipher in the quotient behind the crooked line, and if there remaine any fygures in the diuidend which ar not yet fyniſhed: I muſt remoue the diuiſor againe nerer toward my right

hande by one place, for to fynd a new fygure in the quotient. As in this our example, for after that I haue remo=ued yͤ diuisor, I seeke how many tymes 45, is conteyned in 12: and because I cã not haue 45 in 12, I put

```
   1
 3̸ 1̸ 6̸ 2 1 5
 ______________
    45 (70
```

a o behinde the crooked line after 7: thẽ without multiplying or abatinge, I remoue agayne the diuisor neerer towarde my right hande, and I seeke how many tymes 4, (which is yͤ first fygure of the diuisor) is in the higher numbre, yͭ is to say, in 12, whereas I fynde yt 3 tymes: I put 3 behynde the crooked lyne, for yͤ thyrd fygure of the

```
   1
 3̸ 1̸ 6̸ 2 1 5
 ______________
      45 (703
      135
```

quotient: then by the same fygure 3, I multiplye the diuisor 45, and thereof commeth 135. And in the number o=uer it there is but 121, so that I cãnot take it out of 121, whiche is the lesser number. And therfore heere is to bee noted A note.

noted, that if it happē, that the fygure beyng last founde which is put in the quotient, doe produce or brynge forthe a greater numbre (in multiplyinge all the dyuisor by the same) then ẏ which is ouer the sayd diuisor: you must thē make the same figure of your quotiēt (whiche you doe put downe) lesser by 1, and after that you haue cācelled the fyrste multiplication, you must make a newe. And the same must be done so often tymes: as (in decreasinge the same) it may produce a lesser numbre, or at the least, a numbre equall to that which is ouer it, as in the last worke, forbycause that the dyuisor, beynge multiplyed by 3, bringeth foorth 135, whiche amounteth more then 121. Therefore the same product must bee cancelled, and the fygure 3, whiche I did put in the quotient, must bee also chaunged into a figure of 2. Then by the sayed 2, I must multiply the diuisor 45, and thereof commeth 90, the whiche I abate from 121, & there remayneth 31. And then will the sūme

stande

stand thus, as followeth.

1 3
3 1 6 2 1 5
4 5 2
1 3 5 (702
9 0

And here is also to be noted that the summe whiche remaineth must be alwaies lesser then the diuisor. Then finally I remoue the diuisor to the 2, next figures towarde the right hand, and I seke how manye times 4 is in 31, & for bycause I finde it 7 tymes, I put 7 in ye quotient, by ye which I multiply the diuisor, and therof commeth 315, the which I abate from ye higher number of the diuidend, and there remaineth nothing as here you may se. *A note.*

1 3
3 1 6 2 1 5
4 5 (7027
3 1 5

But if it happen that after the diui-

sion

sion is ended, there do remaine anye thinge in the diuidend, as often times ther doothe: I must also set them that remaine apart behind the croked line, after the entier quotient, and the diuisor right vnder the same remaine, wt a lyne betwene them both. As in this diuision folowing, where ther remaineth 3 in the last worke. And what ye same doth signify shalbe taught vnto you when I shall treate of fractions or broken numbers.

A note.

i.

1 1
~~4~~ ~~6~~ ~~7~~ 8 5 9
~~4~~ ~~5~~ ~~6~~ (1

ii.

1 1
~~4~~ ~~6~~ ~~7~~ 8 5 9 (10
~~4~~ ~~5~~ ~~6~~

iii.

2
~~1~~ ~~1~~ 7 3
~~4~~ ~~6~~ ~~7~~ ~~8~~ ~~5~~ 9
~~4~~ ~~5~~ ~~6~~
~~0~~ ~~1~~ ~~2~~ (102

iiii.

2
~~1~~ ~~1~~ ~~7~~ ~~3~~ 3
~~4~~ ~~6~~ ~~7~~ ~~8~~ ~~5~~ ~~9~~ $\frac{3}{456}$
~~4~~ ~~5~~ ~~6~~ (1026.
~~2~~ ~~7~~ ~~3~~ ~~6~~

In summe, all the whole practise of

diuision

diuision may be kept in remembrance by three letters, that is to say: S. M. and A. which three letters doe signify to seke, to multiply, and to abate.

First I must seke how many times the diuisor is conteyned in the higher number: then by the quotient (which I finde) I must multiply the diuisor: finally, I must abate the product of ye multiplication, from the higher number correspondent to the same, that is to say: out of the diuidende, aunswerynge to the diuisor.

And further, besides this kinde of workinge in diuision. The which is regular and commune: I wil here put another mãer of workinge very easy. The which shall serue for such diuisiõs as are more difficil to be wrought. That is to wyt, when ye number to be diuided is very great, and the diuisor great also, and it shal serue againe for to auoide errour in supputacion, and for the placing of fewer figures in the quotient: and consequētly it shall saue much

much labour vnto them which as yet haue not muche studied in this arte. The practise whereof is thus as followeth.

If you would diuide 7894658, by 643. Fyrst you shall vnderstande, that although the figure of the diuisor toward your lefte hande, may be found many tymes in the highernumber, as 10 tymes, 12 times, or more: yet is it so, that you must neuer put but one figure onely at a tyme in your quotiẽt. And you shall at no tyme put any nũber in your quotient which exceedeth the fygure of 9, that is to say, any nũber being greater then 9. And therfore for to come vnto youre practise, write downe youre dyuisor one tyme, & behynde it towarde youre right hande, drawe a lyne downe straight, & right againste the same diuisor behinde the lyne toward ẏ right hand, put this fygure 1. Thẽ double your said diuisor and right against the same which you haue doubled, put behindethe lyne the fygure of 2. Thys done you shal adde

vnto

vnto the same number that you doubled, your said diuisor, & right against the same product, behind the lyne you shall put ẏ fygure of 3, and vnto thys thyrde product you must adde againe youre diuisor, and righte againste the same product behinde the line, set the fygure 4, And this muste you doe, vntyll you come to the fygure of 9, in suche sorte that euery of the products doe surmounte so muche his former number, as all ẏ diuisor doth amounte vnto: placinge at the right syde of euery product behinde the lyne, the number which signifieth howe much he is in order. That is to say, right against the fift producte, you must put 5, and right against the 6 product, you must putte 6. And so lykewise of all the other.

The Exaumple followeth in the nexte page.

Example of the diuisor proponed, 643: Fyrst of all I wryte downe 643, & right agaynst yͤ same behinde the line toward my right hand, I put 1: secondly, I doble 643: and they make 1286: & right against yͤ summe behynde yͤ line, I put 2: Thirdly, vnto that same 1286, I adde the diuisor 643, and they are 1929, and right agaynst the same I sette 3. Fourthly, vnto the sayd 1929: I adde the diuisor 643, and they make 2572: and right agaynst the same, I put 4. And thus must you doe allwayes by encreasing so muche euery product, as the diuisor dothe amount vnto, vntyll you haue so done nyne tymes, as you see in this present Table.

643	1
1286	2
1929	3
2572	4
3215	5
3858	6
4501	7
5144	8
5787	9

Thys beynge done, you must sette downe youre dyuisor vnder the dyui-

dend

dend 7894658, after the same maner as is before declared: ỳ is to say, 643, vnder the three fyrst figures of the diuided toward your right hand, namely vnder 789. Then must you seeke how many tymes 643, are conteyned in 789: And for to know the same, you muste looke in the foresayde table, yf you may there fynde the same numbre 789, the whiche is not there. Therefore you must take a lesser number, the neerest to it in quantity that you can fynde in the table, the whiche is 643, whiche numbre hathe agaynste it on the ryght hande of the lyne, this diget 1: Then take the sayd 1, and put it behynde the crooked lyne, for the fyrst fygure of the quotient.

Then you must abate 643, from 789, and there will remayne 146 the same shall you put ouer the 789, and cancell the 789: and thus is the fyrste worke ended. Then set forwarde the diuisor one figure nerer to your right hande, and seeke a newe quotient as you sought thys, where you fynde the

higher

higher numbre ouer youre dyuisor to bee 1464. The whiche seeke in the table, and for bycause you can not fynd it ther, you must take a lesser numbre, the nighest to yt that you can fynde, & that is 1286: whiche numbre hathe agaynst yt this diget 2. Therefore you must put 2, for the seconde fygure of the quotient behynde the lyne, & then abate 1286, from the sayde 1464, and there will remayne 178. Thirdly, remoue forward ẏ diuisor as you did before, and you shall fynde the hygher numbre ouer yt to be 1786, so that the next lesser numbre to it in your table, is agayne 1286, put therfore once agayne 2, in the quotient for the thyrde fygure: and abate the sayd 1286, from 1786, so there will remayne 500.
Fourthly, set forwarde the dyuisor: & the hygher numbre ouer yt, is 5005, and ẏ next lesser numbre to it in youre table, is 4501, right agaynst ẏ whiche is 7, put 7 in the quotient, for ẏ fourth fygure. And after that you haue abated 4501, from 5005: there will remayne

mayne 504. Finally, remoue forward youre dyuisor vnto the last place: and you shall fynde the hygher numbre ouer yt to bee 5048. And the next lesser nūbre to yt in your table, is 4501. Therfore set 7, agayne in the quotiēt, for the fyft & last fygure. Then subtract 4501, from 5048, and there will remayne 547: whiche must be put at the ende of the whole quotient, with ỹ dyuisor vnder yt, and a lyne betweene them in thys manner folowinge.

$$(12277.\ \frac{547}{643}$$

The summe of Diuision.

VVHen you woulde dyuide any numbre by 10: you must take away the laste fygure next towardes your ryght hande, and the rest shallbe the quotient. Example: As yf you would dyuide 46845, by 10: take away the 5, and then 4684, shallbe the quotient, and the 5, shalbe the numbre that dothe remayne. Lykewise when you woulde dyuide any numbre by

100. take away the two laste fygures towardes youre right hande, & if you woulde diuide by 1000, take away three fygures, if by 10000, take away foure figures. And so of all other, whē the firste figure of the diuisor towarde the lefte hande shallbe onely 1, & the reste of the same diuisor beynge but cyphers.

Heere folowe the proofes of Addition, *Subſtraction*, Multi-*plication, and Diuiſion.*

The profe of Addition.

VVHen you woulde proue whether your addicion be well made, consyder the figures of the nūbers which be added, euerye one in his simple value, not hauing any regard to the place where he standeth, but to recken hym as though he were alone by himselfe, and then recken them all, one after an other, castinge awaye from them the

number of 9, as ofte as you may.

And after your discourse made, kepe in minde, the same figure wich remaineth after the nynes be taken away: or els set the same in a voide place at the upper ende of a line. For if your addition be well made, the like figure will remaine, after that you haue taken a way all the nines out of the total summe of the same addition, as oftentimes, as you may there fynde any: as i this additiō which heere you see, there remayneth 2, for eche parte.

24567	2
5329	
481	
30377	2

The proofe of Subtraction.

ADde the number whiche you doe subtract unto that number which remaineth after the subtraction, is made, and if the totall summe of that addition, be like unto the number frō the which the subtraction was made,

you haue done well, otherwise not: as in this example doth appeare, wher you see the number which is to be subtracted from 5463, is 3584, and the number which dothe remayne, is 1879, ÿ which two summes beinge added together, doe make 5463, whiche is lyke to the higher number, out of the which the subtraction was made, as before is said.

5463
3584
1879
5463

The profe of multiplication.

THe profe of multiplicatiō is made by ÿ help of diuisiō. For if you diuide ÿ nūber produced of ÿ multiplication, by the multipier, you shalfinde the higher number which is the multiplicand.

The profe of diuision.

TO knowe if your diuision be well made: you must multiplye all the quotient by your diuisor, and if anye thing do remaine after your diuision is made, the same shall you adde vn-

to the product which commeth of the multiplication, and you shall find the like number vnto youre diuidende, if you haue well diuided: otherwise not.

Of progression the *6 Chapter.*

Progression arithmeticall, is a briefe & spedy assembling or addinge together of diuers fygures or numbers, euerye one surmounting the other continuallye by equal difference: as 1,2,3,4,5,&c. heere the difference, from ÿ first, to the second, is but of 1, & so do all the other, euery one excede his former figure by 1, stil to the ende. Like waies 2,4,6,8, &c. doe procede by ÿ differēce of 2. Also 3,6,9,12, &c. doe euerye one differ from other by 3, And so may these numbers continue, infinitely after this order, in addinge vnto ÿ third nūber, ÿ quantity where in ÿ second doth differ frō ÿ first: Like waies addinge ÿ same difference vnto ÿ fourthe nūber, also to ÿ fyft, and so vnto al the other: as 1, 4, ÿ difference of the seconde to the firste is 3, adde *Progressiō Arithmeticall.*

3 vnto 4 and they are 7 for the thirde number. Thẽ adde 3 vnto 7, and they make 10 for the fourthe number, and ſo of all other.

Then if you will adde quickly the number of any progreſſion, you ſhall doe thus, firſt tell how many nũbers there are, and write their ſumme downe by it ſelfe, as in this exãple, 2, 5, 8, 11, & 14, where the number of their places are 5, as you may ſee, therfore you muſt ſet downe 5 in a place alone as

5. I haue done here in the margent. Thẽ ſhal you adde the firſt number and the laſt together, which in this example are 14 and 2, and they make 16, take halfe thereof which is 8, and multiply it by the 5 which I noted in the margẽt, for the number of the places. And the ſumme which amounteth of that multiplication, is the iuſt ſumme of all thoſe figures added together. As in this example: 8 multiplied by 5 do make 40. And that is the total ſumme of all the figures. Another example of parcels ỹ are euẽ, as thus, 1, 2, 3, 4, 5,

and 6. So that in this example you muſt likewaies note downe the number of the places, as before is taught, and then adde together the laſt number & the firſt. And the ſumme which commeth of that addicion, ſhall you multiplye by halfe the number of the places whiche before are noted, and that, which reſulteth of the ſame multiplication, is the whole ſumme of all thoſe figures, as in this former example, where ỹ number of the places is 6, I note the 6 aparte, and then I adde 6 and 1 together: which are the laſt and firſt numbers, and they make 7, the whiche I multiply, by 3 which is halfe the number of places, & they make 21, & to ſo muche amounteth al thoſe figures added together.

Queſtions done by Progreſsion Arithmeticall.

1. A Marchant hath ſolde 100 kerſies, after this maner following, that is to ſay, the fyrſt peece for

1 s̄. the second peece for 2 s̄. the thyrde for 3 s̄. and so furthe, rysinge 1 s̄. in euery peece of kersey, vnto the hūdreth peece. The question is to know, how much he shall receiue for the sayd 100 peeces of kerseis? Aunswere. It behoueth you to know the addicion of the 100 termes in this progressiō: And therfore you must adde 1 s̄, which is the price of the firste peece with 100 s̄: which is the price of ẏ last peece, and thereof cometh 101: the same 101 you must multiply by halfe the number of places, that is to saye by 50, & thereof commeth 5050 s̄. which beinge diuided by 20 s̄. thereof will come, 252 li. 10 s̄. 0 d̄. which is 2 li. 10 s̄. 6 d̄. a peece, one with an other. Thus the 100 kerseis are sould by the saide marchant for 252 li. 10 s̄. 0 d̄. The practise foloweth.

```
 100
   1        X 1
 ---
 101        5050   (252 li. 10 s̄.
  50        2220
 ----
5050
```

Questions

Questions of progression.

2 I woulde laye 100 stones or other thinges in a right line, and euery of the saide stones to bee a iust pace one from an other, and one pace of from the first stone, there standeth a basket. I demaunde howe manye pases a man shall goe in gatheringe vp the saide stones, and bearing them vnto the basket, the one stone after the other? Aunswere. First when he fetcheth the first stone & putteth it into the basket, he maketh 2 paces, for the second, 4 paces, for the thirde 6, for the fourth 8: And so furth vnto ẏ last stone: wherefore the last terme shall be 200: vnto the which you must adde the first terme which is 2, and they make 202, whereof the halfe is 101, the which you shall multiplie by 100 which is the number of the termes in your progression: or else multiplye 202 by 50 which is halfe ẏ number of places, & therof will come 10100 paces, and so many paces shall he go in all.

Questions of Progresion Arithmeticall.

3. There is a messenger whiche goeth euery day 8 myles: an other mā followeth him incōtinently, & he goeth ẏ fyrst day 1 myle, the secōd day, 2 myles, the thirde day, 3 miles, and so encreasinge his iourney euery day one mile by naturall progression. The question is to know, in how many dayes the second man shall haue ouertaken the fyrste. Aunswere. You must considre that 8 is the myddle or halfe as well of the termes, as of the number of the dayes: And therefore double 8, therof cōmeth 16: Subtract 1, and there will remayne 15: and in so many dayes shall he haue ouertakē the fyrst messenger. The proofe therof is very easy. If the seconde had gone the fyrst day 2 myles, the seconde day, 4 myles, the thyrde day 6 myles, and so encreasinge euery day his iourney, by 2, In howe many dayes shoulde he haue ouertaken the fyrste man, for to

do thys, you must perceyue that 8 is the myddle and fourth terme. Therefore double 4, and they make 8, from the whiche subtract 1, and there remayneth 7, and in so many dayes hee should haue ouertaken him.

Questions of Progression Arithmeticall.

4. There is one man departeth from London to Chester, and so to Carnaruan, the distance beynge about 200 myles: He goeth the fyrste day 1 myle, the second day 2 myles: ỹ thyrde day 3: and so orderly by natural progression. An other man departeth at the same instant from Carnaruan to London, and goeth the fyrst day, 2 myles: the second day, 4 myles: the thirde day, 6 myles: and so encreasing euery day, 2 myles. The Questiõ is, to know, in how many dayes they two personnes shall meete together. Answere: Fyrste you must consyder, that hee whiche goeth by Progression naturall

naturall, maketh but halfe the way ẏ the other dothe, ſo that hee ſhall haue made but the one thyrde parte of the way, at their meeting together. Take therfore the $\frac{1}{3}$ parte of 200, and you ſhall haue $66\frac{2}{3}$. Thē muſt you ſeeke 2 numbres, whereof the greater of them, may bee double vnto the other, leſſe 1: & that the one of them beynge multiplyed by the other, the producte of them may be $66\frac{2}{3}$, or little more, ſo that ẏ more doe not exceede the valew of the greater terme: as heere in this queſtion the 2 nereſt numbres are 12, and $6\frac{1}{2}$, whiche multiplyed the one by the other doe make 78, whiche is $11\frac{1}{3}$ more thē is $66\frac{2}{3}$. wherfore that day whē they ſhould meete together, the fyrſt had gone but $\frac{2}{3}$ of a myle of hys iourney, which was vpon the 12 day: then yf you will know what part of a day that they did meete, you muſt dyuide $\frac{2}{3}$ by 12, & you ſhall fynde $\frac{1}{18}$, of a day. Therefore in 11 dayes and $\frac{1}{18}$ part of a day, that is vpon the twelfth day, they ſhall meete together.

5. If a man doe owe mee 1000 crownes, to bee payed in 20 dayes, or termes, by Arythmetical progression: The question is, to knowe with what number he shall beginne & continew his progression? Aunswere: to doe this, you must adde 1 vnto 20, And they make 21, the whiche you shall multiply by 10, whiche is halfe the number of places, and thereof cometh 210, and therfore diuide 1000, by 210, and therof wil comme $4\frac{16}{21}$, the payment of the fyrste day, and by this number, doth the sayde Progression encrease, in this sorte following: $4\frac{16}{21}$, $9\frac{11}{21}$, $14\frac{6}{21}$, $19\frac{1}{21}$, &c. And so of all others.

A man oweth me 400 li. to be paid in 10 yeares, by progression Arithmeticall, that is to say, 40 li. at the end of the fyrst yeare, and euery yeare following 40 li. to the ende of 10 yeares: he offereth to pay me the sayd 400 li. al at one payment. The question is to know, at what tyme hee ought to pay me the same at one payment, that I bee

bee not interessed in ye time? *Answere*, adde 1 unto the number of the termes which are 10, & they make 11, whereof you must take ye halfe, yt is to say, 5 ½: Therfore he must pay me at 5 yeare & ½ ye said 400 li. all at one tyme: for that whiche he payeth before, is equall to yt which remayneth unpayed.

This Rule hath place onely whē ye payments are equall. But if it happē, that the laste payment be lesser then ye others, you must in this case, put ye last payment ouer one of the others, for to make thereof a fraction: ye which must be added unto ye nūber of the termes, & the halfe of the saidsūme being takē, shall shew the time, yt the sayd paymēt ought to be payd at once. As if ye saide party dyd owe me but 380 pōudes, to be payd euery yeare 40 li, it is certaine that hee must haue 10 yeares to ende the payments. And it is true yt uppon ye 10 day there would remaine but 20 li. to be paid: And therfore put 20 ouer 40 in this sorte $\frac{20}{40}$, & that maketh ½, ye which you shall adde unto ye nūber of termes, & you shall haue 10 ½, where-

of the halfe which is 5 $\frac{1}{4}$, dothe shew that he must pay the sayed 380 li. at 5 yeares $\frac{1}{4}$, all at one payment, and so of all suche lyke.

Progression Geometricall is when the secōd number conteyneth the first in any proporciō: as 2, 3, or 4 times, & so forth. And in like proporciō shall ỹ thirde number conteyne the seconde, and the fourthe number conteyne the thirde, and the fift the fowerth. &c. As 2, 4, 8, 16, 32, 64: here the proporcion is double. *Progressiō Geometricall.*

Likewaies 3, 9, 27, 81 and 243: are in triple proporcion.

And 2, 8, 32. 128 and 512, are in proporcion quadruple.

That is to say, in the first example, where the proporcion is double, euery number containeth the other 2 times, as 4 conteyneth 2, two tymes: 8 conteyneth 4, two times. &c. In the secōd example of triple proporcion, the nūbers exceede eche other three tymes. And the third example, the numbers exceede eche other foure times, & thus

you

you see that progression Arithmetical, differeth from progression Geometricall for that, that in progression Arithmetical, the excesse is onely in quantity, but in progressiō Geometricall, the excesse is in proporcion.

Now if you will easely fynd the sum of any such nūbers, you shal do thus, consider by what nūber they be multiplied, whether they be multiplied by 2, 3, 4, 5, or by anye other: and by the same number, you must multiply the last summe in the progressiō. And from the producte of the same multiplication, you shall abate the first nūber of the progression. And that which remaineth of the sayd multiplication, you shall diuide by 1 lesse then was ẏ nūber by ẏ which you did multiply, & ẏ quociēt shal shew you the sum of all ẏ nūbers in any progressiō. As in this exāple, 5, 15, 45, 135 & 405: which are in triple proporciō. now must you multiplye 405, which is ẏ last nūber, by 3: bycause they are in triple proporcion, and they are 1215, from the whiche

you

you shall abate the first number of ye progressiō, which is 5, & there remaineth 1210: the which you shall diuide by a number lesse by 1, then that was by the which you did multiplye, that is to say by 2: and you shall finde in the quocient 605: which is the totall summe of the numbers of that progression. Likewise 4,16,64,256, and 1024, whiche are in proporcion quadruple: therefore you shall multiplye 1024, by 4, and therof wil come 4096 from the whiche abate the first number 4, & there will remain 4092: The which you muste diuide by 3, and you shall finde in your quotiente 1364: which is the totall sum of that progression, & this shalbe sufficient for progression.

A question of progression Geometricall.

A marchaunt hath solde 15 yardes of Satten, the first yarde for 1 s. the second 2 s. the third 4 s. the fourth 8 s. and so encreasing by double progression Geometricall. The question

is

is to know, how much ẏ said marchāt shall receiue for the said 15 yardes of satten? *Aunswere:* First it is needefull to know how muche the whole numbers of the saide progression doe amounte vnto togither. And for to doe it you must finde the last terme, therefore you must set downe the sayd progression vnto the 8 terme, whiche is 128: the which you shall multiply by it self, and thereof cōmeth the fiftenth terme, that is to say, 16384: the same shall you multiply by 2, for bycause ẏ progression is double. And thereof wil come 32768, from the which you must subtract the first terme which is 1. And the rest beinge 32767, is the iust summe of the 15 termes: and cōsequently the 15 yardes of satten shal be worth 32767 shillinges, the which are 1638 li. 7 s.

The

The vii. Chapter treateth of the rule of three, called the Golden rule: or the rule of foure Proportionals.

THE rule of three is the chiefest, the moste profitable, and the moste excellent Rule of all the rules of Arithmetike. For all other rules haue nede of it. and it passeth all other, for the whiche cause it is saide, that the Philosophers did name it ye golden rule. And after others opinion and iudgement it is called the rule of proporciō of foure nūbers. But now in these latter daies, by vs it is called the rule of three, bycause it requireth three numbers in his operation. Of the whiche thre nūbers, ye two first are set in a certeine proportiō, & in such proportiō as they be stablished, this rule serueth to finde out vnto ye third nūber, ye fourth number to him proportioned, in suche sort as ye secōd is proportioned vnto ye first. Not for that, that the fower nūbers, nor yet the thre, are or be propor-

cionall, or sett in one proporcion, but suche proporcion, as is from the firste to the secõd, ought to be from ye thirde unto the fourthe, that is to saye, if the seconde number do conteyne the first twoo times or more, so manye tymes shall the fourthe number containe the third. And note well that the first nũber, and ye third, in euery rule of three ought and must be alwaies of like denomination, and of one cõdicion and nature. And the second number, and ye fourth muste likewise bee of one semblance and likenesse, and are dissemblante, and contrary to the other two numbers: that is to say, to ye first, and the third. And if you doe multiply the first nũber by the fourth, & the second number by the third, the productes of your twoo multiplications will be equall. Likewise if you diuide the one semblant by the other, that is to saye, the thirde number by the firste, and likewise the one dissemblante by the other, that is to saye, the fourth nũber by the second (whiche are dissemblant

to the other two numbers) your two quotients will also be equall.

The style and maner of this rule, is thus: you must sette down your three numbers in a certeine order, as by example folowinge shall appeare. And then you shall multiply the thirde nūber by the seconde, and the product or nūber ỹ commeth of ỹ same multiplicatiō, you muste diuide by the first nūber, or otherwise, diuide the first number by the seconde, and the quotiente thereof shall be your diuisor vnto the third number, that is to say, the thirde number shalbe diuided by the quotiēt of the foresaid diuisiō, ỹ is by the quotient of the firste nūber diuided by the second. Or otherwise, diuide the secōd number by the firste, and that number whiche commeth into your quotiente, you shall multiply by the thirde number. And thus shall you haue ỹ fourth number which you seke for. And thus is your fourth nūber in suche proportion vnto the thirde, as your seconde number is vnto the first. Rule.

Example.

If 8 bee worthe 12, what are 14 worth, after the rate? or else if 8, require 12, for his proportionall, what will 14, demaunde? The whiche three numbers may conueniently be sette in such order, as hereafter doth appeare.

If 8 make 12, what will 14 make? you must multiply the thirde number 14, by the seconde whiche is 12, And thereof commeth 168 for the whole producte of this multiplication: the which (as the rule teacheth) you must diuide by the first number, that is to say by 8, and therof commeth 21. And so muche are the 14 worthe. This is the way whiche is most vsed.

8.. 12.. 14..

	14
	12
	28
	14
	168

~~1~~~~6~~~~8~~ | 21.
~~8~~~~8~~

Otherwise diuide 8 by 12, which you can not doe, for they are $\frac{8}{12}$, wherfore abbreuy $\frac{8}{12}$, and they are $\frac{2}{3}$ for youre quotient, thē diuide the thirde nūber 14, by the sayde $\frac{2}{3}$, multiplying 14, by 3, whiche maketh 42: diuide 42 by 3, and you shall haue 21, as before. Or els diuide the seconde number 12: by the first number 8, and thereof commeth 1 $\frac{1}{2}$, the whiche 1 $\frac{1}{2}$, you shall mulciply by the thirde number 14, and thereof wyll come 21, as is aboue sayde: and thus must you doe of all other, & although, that the numbers of this rule may be founde in three differences, for sometymes they are whole numbers and broken togither, sometymes broken number, & broken together, and somtymes all whole numbers, yf they bee whole numbers, you muste doe none otherwyse, then you did in the laste example. But in case they be broken numbers, or broken and whole numbers together, the maner and waye to

2
4
8
12
6
3

doe them, requireth a certaine varia-
tion and difficultie, accordinge to the
variety of the numbers that shall bee
proponed: the which operation easily
to doo, and vnuariably, this rule tea-
cheth.

The three nūbers beinge set downe
according vnto the order of the whole
numbers aforesaid, without any bro-
ken number, let 1 be put alwaies vn-
dernethe euery whole number, with a
line betweene them fraction wise, as
thus $\frac{8}{1}$, and that 1 is denominator to
euery such whole number. But when
you haue whole number and broken
together they must be reduced and ad-
ded with their broken number, and if
there be broken number without any
whole number, the same broken must
remaine in their estate.

The rule of three in fractions.

This being donne, you shall mul-
tiply the denominator of the first num
ber, by the numerator of the seconde

and multiplye the producte thereof againe by the numerator of the thirde number. And so shall you haue the diuidende, or number which must be diuided, thē multiply the numerator of the first number, by the denominator of the second, and multiply againe the product thereof by the denominator of the third number, and that which cōmeth of this multiplication shall bee your diuisor. Thē diuide the number whiche is to be diuided by ẏ diuisor, & you shall finde the fourthe number ẏ you seke. Of the which maner and facions, of ẏ rule of 3, are diuers kinds, whereof the firste is of 3 whole numbers, as was ẏ last example, and here foloweth the second.

If 15 poundes doe buy me 2 clothes, howe manye clothes will 300 pounds buy me of the same price, that the two clothes did coste: Set downe your three numbers thus.

The example foloweth in the next page.

Lib.	Clothes.	Lib.	
15.	2.	300.	1̸
		2	6̸0̸0̸
		600	1̸5̸5̸ (40
			1̸

And than as you see, you must multiply the third nūber which is 300 li. by 2, which is the second number, and therof commeth 600, the whiche 600 you muste diuide by the firste number 15. and you shall finde in your quotient 40, which is 40 clothes, and so many clothes shall you buy, for 300 li. as appeareth by practise heere aboue written. And heere you must marke ẏ the first number and the thirde in this question be of one denomination, as before I haue declared, and likewise ẏ second & the fourth numbers which you haue founde, are of one semblāce and likenesse, but in case that the first number and the thirde in any questiō be not of like denomination, you must in (workinge) bringe them into one denominatiō, or nature, as in this ex-

ample

ample folowinge. If 12 nobles doe gaine me 6 french crownes, how manye french crownes wil 48 poundes gaine me? Here you see that the denomination of the firste number, is nobles, and the Denomination of the thirde, is poundes: wherefore, before you doe proceede to worke by the rule of three, you must first turne ye pounds into nobles, in multiplying 48 poũds by three nobles, and they make 144 nobles, for yt there is in euery pounde of mony 3 nobles, or otherwise if you will, you may bringe the first number beinge 12 nobles, into poundes, by dividinge them by 3, and thus shall your first & third numbers be brought into one denomination: then shal you sett downe your 3 numbers in order, thus.

If 12 nobles do gaine me 6 french crownes, what shall 144 nobles gaine? the which 144 are the nobles whiche are in 48 li. Then multiplye the third number 144, by the seconde number 6, and thereof commeth 864,

the whiche you must diuide by 12 nobles, and therof commeth 72 Frenche Crownes.

And so manye Frenche Crownes will the 144 Nobles gayne me.

Nobles.	Crownes.	Nobles.
12.	6.	144.

144	~~1~~ ~~2~~ ~~0~~	Nobles.
6	~~8~~ ~~6~~ ~~4~~	(72
864	~~1~~ ~~2~~ ~~2~~	
	~~1~~	

There is yet a more exact waye, whereby to work in this rule of three, whiche is thus. You must marke if ẏ thirde and first numbers in the rule of three, may be both diuided by one like dyuisor: the whiche after you haue diuided them, you shall write downe each of the quotientes orderly, in the sayd rule of 3, euerye one of thē in his owne place, as though those were 2 of the numbers of your question, and not changinge the middle number, ẏ is

is to say the seconde. As thus, if 50 Crownes doo buy me 44 yardes of cloth, how many yardes shall I haue for 120 Crownes? Heere you may see that the thirde and the first numbers, may be diuided by 10, whiche in the thirde number, is founde 12 times, & in yͤ first 5 times. wherefore you shall put 12, for the thirde number in the rule of three, in stede of 120: and 5 for the first number in stede of 50, and let 44 remaine still in the middest, for the seconde nũber, after this sorte as foloweth, & thẽ worke by yͤ rule as before.

Crownes. *Yardes.* *Crownes.*

5. 44. 12.

12.

87.

44 3

528 ~~528~~ (1058.

~~555~~

You must multiply 44 by 12 and thereof commeth 528: diuide the same 528 by 5, and you shall finde in youre quotient 105, $\frac{3}{5}$. and euen so manye

yardes

yardes should you haue founde, if you had wroughte the rule of three, by the first numbers proposed. There is yet certaine other varities, in workinge by the rule of three, but for that they require the knowledge of fractions, & because they are not so easye as this first way, which is common, therefore content your selues with this same, vntill you haue learned the fractiōs, ỹ which by Gods help I intende to set furth in the second part of this booke incontinentlye after that I haue firste taught you the backer rule of three.

Of the backer rule of three.

The backer rule of three is so called: because it requireth a contrary woorkinge to that, whiche the rule of three directe dothe teache, whereof I haue now treated. For in the direct rule of three, the greater the third number is, so much the greater wil the fourth be. But here in this backer rule, it is contrariwise, for the greater the third nū-

ber is, so muche lesser will the fourthe be. Then, whereas in the rule of three direct, the thirde number is multiplyed by the seconde, & the product therof diuided by the firste. Heere you must multiply the seconde number by the first, and diuide the product of ye same by the thirde, and the number whiche commeth in the quotient, answereth to the question. For suche practise cometh often times in vse: In suche sort that if you should worke the same by the rule of three direct, and not to haue a regarde vnto the Proposition of the question, you shoulde then commit an euident and open error.

Example.

If 15 shillinges worthe of wyne, will serue for the ordinary of 46 men, when the Tonne of wyne is worthe 12 poundes: for how many men will the same 15 shillinges worth of wine suffice, when the Tonne of wyne is worthe but 8 poundes? It is certayne

tayne, that the lower the price is, that the Tonne of wine dothe cost, and so many more persons, will the sayde 15 shillings in wine suffice. Therefore, set downe your numbers thus: if 12 poundes suffice 46 men, for how many men will 8 poundes suffice: you must multiply 46 by 12, and thereof commeth 552, the whiche 552, you shall diuide by 8, and thereof commeth 69, and vnto 69 men, will the sayde 15 shillinges worthe in wine suffice, when the Tonne of wine, is worthe but 8 poundes, as hereafter doth appeare by practise.

Lib.	Men.	Lib.
12.	46.	8.
	12.	
	92.	
	46.	
	552.	

7
~~552~~ (69.
~~88~~

2. Likewise, a messenger maketh a iourney in 24 dayes, when the day is but 12 houres longe: in howe manye dayes

dayes shall hee make the same iourney, when the day is 16 houres in length? Here you must perceaue, that the more hou res there are in a day, the fewer dayes will the messenger bee in goyng his iourney. Therefore write downe youre numbers thus, as heere you may see.

Houres.	*Dayes.*	*Houres.*	
12.	24.	16.	4
	12.		12
	48.		288
	24.		166
	288.		1 (18.

And then multiply 24 dayes by 12 houres, and thereof commeth 288: diuide the same 288, by the thirde number 16, & you shall finde 18, ÿ which is 18 dayes, and in so manye dayes will the messenger make his iourney, when the day is 16 houres longe.

Likewise, when ÿ bushell of wheat dothe cost 3 shillinges, the penny lofe of bread weigheth 4 lib.

I demaunde what the same penny lofe shall way, when the bushell of wheate is worthe but 2 shillinges: here is to bee considered, that the better cheape the wheate is, the heauier shall the peny lofe way, and therefore write downe youre 3 numbers, thus.

Shil.	Lib.	Shil.		
3.	4.	2.		
	3.		~~1~~ ~~2~~	Lib.
	12.		~~2~~	(6.

Then multiply 4 lib. whiche is the seconde number by the firste number 3, and they make 12, ye whiche 12 you shall diuide by the thirde number 2 & thereof commeth 6 li. & so muche must the peny loafe of bread way, when ye bushell of wheat is worth but 2 shillinges as may appeare. And now accordinge to my former promise, shall follow the seconde parte of Arithmetike, whiche teacheth the workinge by Fractions.

Heere endeth the first parte of Arithmeticke.

The seconde parte of Arithmeticke, which treateth of Fractions or broken numbers.

The first Chapter treateth of Fractions, or broken numbers, and the difference thereof.

A Fraction or a broken number, is as much, as a parte or manye partes of 1, whereof there are two numbers with a line betweene them both, yͤ is to say, the one whiche is aboue yͤ line, is called yͤ numerator, and yͤ other vnderneth yͤ line, is called yͤ denominator, as by exãple, three quarters is called a fractiō, whiche must be set downe thus $\frac{3}{4}$, whereof 3 whiche is the higher nūber aboue yͤ lyne is called yͤ numerator, & 4 whiche is vnder yͤ line, is called the denominator. And it is alwaies conuenient yͤ the numerator be lesse in number, thē the denominator. For if the numera-

tor, and the denominator be equal nũbers, then shall they present a whole nũber thus, as $\frac{1}{1}$, $\frac{2}{2}$, $\frac{3}{3}$, which are whole numbers: by reason that the numerators of these, and all such like, maye be divided by ther denominators, and theire quotients will alwaies bee but 1. But in case that the numerator of any fraction doe excede his denominator, then it is more than one whole: as $\frac{29}{18}$, is more than a whole number by $\frac{11}{18}$. And this is commonlye called an improper fraction: other diffinition doth not here unto appertaine. Furthermore it is to be understande that when the numerator is iuste the halfe of ỹ denominator, then the same broken number is the iuste halfe of 1 whole, as $\frac{6}{12}$, $\frac{7}{14}$, $\frac{8}{16}$, $\frac{9}{18}$, & other like, are the halfes of one whole number whether it be of money, of measure, of waight, or any other thinge: whereof doth grow and come forth 2 progressions naturall: the one progredinge by augmẽting or increasing, as these,

$\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{5}{6}$, $\frac{6}{7}$, $\frac{7}{8}$, $\frac{8}{9}$, $\frac{9}{10}$, &c.

And they doe proceede infinitely & will neuer reache to make a whole number, thus $\frac{1}{1}$. And the other progression, dothe progredy by diminishing or decreasing, as thus.

$\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, $\frac{1}{7}$, $\frac{1}{8}$, $\frac{1}{9}$, $\frac{1}{10}$. &c.

And these doe proceede infinitely, & shall neuer come to make a o. which signifyeth nothing, but shall euer retaine some certaine value of an vnitie whereby it dothe appeare that Fractions, or broken numbers are infinite.

The seconde Chapter treateth of the *reducinge or bringinge together, of 2 Fractions or many, of diuers denominations, unto Fractions of one lyke denomination.*

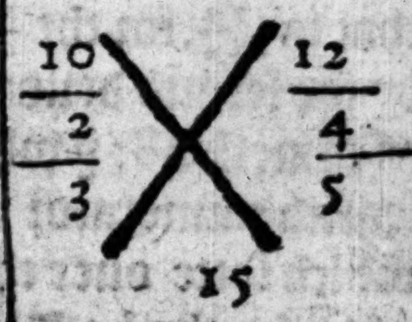
REduction, is as muche as to reduce and bringe together, or to put 2 or many numbers, beyng of diuers denominatiõs the one from the other, into fractions of one denomination,

in reducinge them vnto a commō denominator, and the reason hereof is, For bycause the diuersitie and difference of the broken numbers do come of ẏ denominators part, or of diuers denominators, and for the vnderstandinge hereof, there is a generall rule whose operation or working is thus. Multiplye the denominators of the fractions, the one by the other, and so you shall haue a new denominator cōmon to all the fractions, the whiche denominator you muste diuide by the particular denominators of euerye of the sayde fractions, and multiply euery quotient by his owne numerator, & so you shal haue newe numerators, for the numbers which you would reduce, as appeareth by this example folowinge.

Reduction in common deuomination.

Reduction 1 If you will reduce $\frac{2}{3}$ and $\frac{4}{5}$ togither, first make a crosse betwene the 2 fractions as here you see, & then you

you must multiply yͤ two denomina-tors the one by the other, yͭ is to say, 3 by 5 maketh 15, which is your com-mō denominator, set that vnder the crosse, then diuide 15 by the denomi-nator 3, and you shal haue 5, which



multiply by the numerator 2, and you shall finde 10, set that ouer the $\frac{2}{3}$ and they are $\frac{10}{15}$, for the $\frac{2}{3}$. Afterwardes di-uide 15 by the denominator 5: and there of commeth, 3 the which multi-ply by the numerator 4: and you shall finde 12, which set ouer the heade of the $\frac{4}{5}$ and they make $\frac{12}{15}$ for the $\frac{4}{5}$: as appeareth more plainer aboue in the margent.

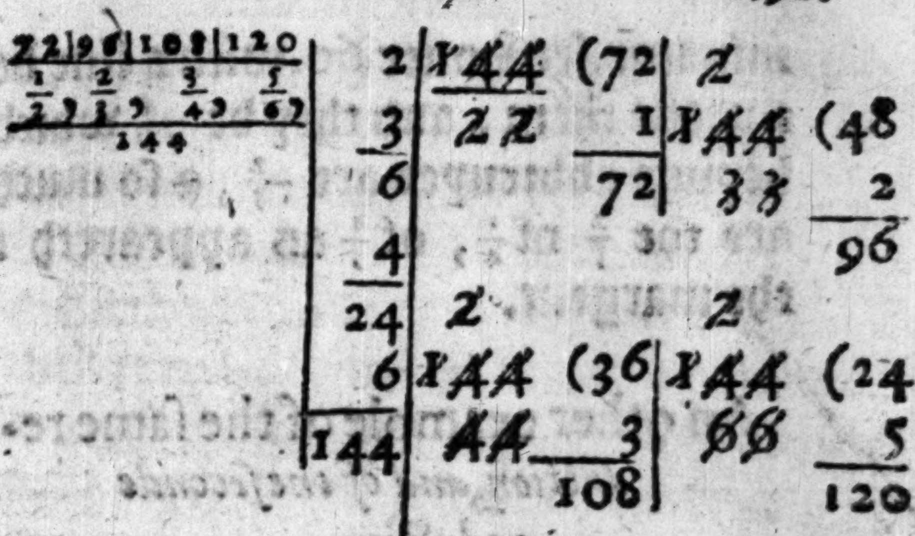
2. If you will reduce $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{6}$, togi-ther, you must multiply all the deno-minators the one by the other, that is to saye, 2 by 3 maketh 6: then 6 by 4 a mounteth to 24, Last of all 24 by 6, and thereof commeth 144: for the cō-mō denominator, The, for yͤ first frac-tion Reduction 2.

tion

tion which is $\frac{1}{2}$ diuide 144, by the denominator 2, and therof commeth 72, the which multiply by the numerator 1, and it is styll 72, set ẏ ouer the $\frac{1}{2}$ & that is $\frac{72}{144}$. for the $\frac{1}{2}$: Then diuide 144 by the second denominator 3, & thereof cōmeth 48: ẏ which multiplye by ẏ second numerator 2, and they are 96, which sette ouer the $\frac{2}{3}$ and they make $\frac{96}{144}$, for the $\frac{2}{3}$: Then diuide 144 by the thirde denominator 4, and therof commeth 36, the whiche multiplye by the third numerator 3, and they make 108: which set ouer the $\frac{3}{4}$, and they are $\frac{108}{144}$ for the $\frac{3}{4}$.

Finally diuide 144 by the last denominator 6, & thereof commeth 24: The which multiply by the last numerator 5, and therof commeth 120. which set ouer the $\frac{5}{6}$, and they are $\frac{120}{144}$, for the $\frac{5}{6}$, as appeareth here by practise.

The example followeth in the next page.



Reduction of broken numbers *of broken.*

If you will reduce the broken of broken together, as thus, the $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$, you must multiply all the numerators, the one by the other to make one broken number of the three broken numbers: that is to say, 2 by 1, maketh 2: and then 2 by 4, maketh 8: whiche 8 is your numerator. Thẽ multiply the Denominators the one by the other, that is to say, 3 by 4, maketh 12, and then 12 by 5, maketh 60, for your denominator, *Reduction 3.*

$$\frac{8}{60}\qquad \frac{2}{3},\ \frac{1}{4},\ \frac{4}{5}$$

minator, set 8 ouer 60, with a line betweene them, and they be $\frac{8}{60}$ whiche beynge abbreuyed are $\frac{2}{15}$, & so muche are the $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$ as appeareth in the margent.

An other example of the same reduction, and of the seconde reduction.

Reduction 5. If you will reduce $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$, the $\frac{3}{4}$ of $\frac{5}{7}$: And the $\frac{1}{2}$, of the $\frac{1}{2}$, of the $\frac{2}{3}$ of $\frac{1}{3}$. First it behoueth you of euery party of the broken numbers, to make of eache of them one broken: as by the thirde reduction is taught: that is to say, in multiplying the numerators by numerators, & denominators by denominators: First for the first part whiche is $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$, you must as is before saide, multiply 2 by 1, & then by 4, and you shall haue 8 for the numerator, likewise multiplye 3 by 4, & the producte by 5, and you shall haue 60 for the denominator: so they make $\frac{8}{60}$ which being abbreuied are $\frac{2}{15}$ for ye first

first part, that is to say, for ye $\frac{2}{3}$ of $\frac{1}{4}$ of $\frac{2}{5}$: secondly for ye $\frac{3}{4}$ of $\frac{5}{7}$ multiply likewise ye numerator 3 by 5, maketh 15, for ye numerator. And multiply 4 by 7, maketh 28, for the denominator. And then they be $\frac{15}{28}$ for the seconde parte: yt is to say, for the $\frac{3}{4}$ of $\frac{5}{7}$. Thirdly for ye $\frac{1}{2}$ of $\frac{1}{2}$, of $\frac{2}{3}$, of $\frac{1}{3}$, you must multiply the numerators the one by the other, that is to say, 1 by 1, and then by 2, & last by 1: and all maketh but 2, for the numerator, likewise multiply the denominators 2 by 2, maketh 4, 4 & by 3 maketh 12, and thẽ 12 by 3 maketh 36, for the denominator: and they are $\frac{2}{36}$, which beinge abreined maketh $\frac{1}{18}$ for the the third part, that is to say, for $\frac{1}{2}$ of the $\frac{1}{2}$, of $\frac{2}{3}$ of $\frac{1}{3}$. Last of all take ye $\frac{2}{15}$, the $\frac{15}{28}$, and the $\frac{1}{18}$ & reduce them accordinge to the order of the seconde reduction, and you shall finde $\frac{1008}{7560}$ for the $\frac{2}{15}$. And $\frac{4050}{7560}$ for the $\frac{15}{28}$. And $\frac{420}{7560}$ for the $\frac{1}{18}$: and thus are broken numbers of broken, reduced as appeareth by practise.

$\frac{2}{3}, \frac{1}{4}, \frac{4}{5}$ — 8 — 60 | 8, $\frac{1}{2}$, $\frac{4}{8}$ | 3, $\frac{4}{12}$, $\frac{5}{60}$ | 2, 8, $\frac{60}{15}$ | 15, $\frac{3}{4}, \frac{5}{7}$, 28

$\frac{1}{6}, \frac{1}{2}, \frac{2}{3}, \frac{1}{3}$ — 2 — 36 | 1, $\frac{1}{1}$, $\frac{2}{2}$, $\frac{1}{2}$ | 2, $\frac{2}{4}$, $\frac{3}{12}$, $\frac{3}{36}$ | 1, 2, $\frac{36}{18}$

1008 — $\frac{2}{15}$ | 4050 — $\frac{15}{28}$ | 420 — $\frac{1}{18}$ — 7560

15		
28	(504	(270
120	2	15
30	1008	1350
420		270
18		4050
3360		
420		
7560		

(420
1
420

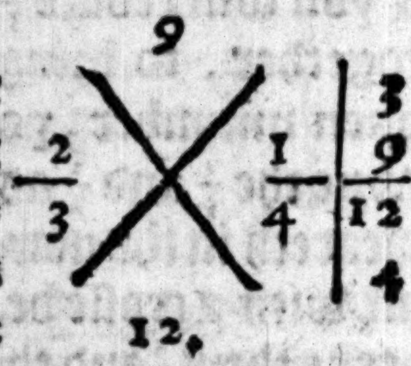
Reduction of broken numbers, and *the partes of broken together.*

Reduction 5.

If you will reduce $\frac{1}{3}$, and the $\frac{1}{2}$ of $\frac{1}{3}$ together, to bringe them into one broken nnumber, you must fyrst sette downe the $\frac{1}{3}$ and $\frac{1}{2}$ as appeareth in the margent with a crosse betweene them, and thē multiply the two denominators, the one by the other, that is to say, 2 by 3, maketh 6, set that under ye crosse, then multiply the fyrst Numerator 1, by the last denominator 2, and that maketh 2: unto the which adde ye last numerator 1, and they be 3, which set aboue your crosse, so you shal finde that the $\frac{1}{3}$ and the $\frac{1}{2}$ of $\frac{1}{3}$, doe make $\frac{3}{6}$: whiche beyng abreuyed doth make $\frac{1}{2}$, whiche is as muche, as the $\frac{1}{3}$ and the $\frac{1}{2}$ of $\frac{1}{3}$, beynge reduced into one fraction. Likewise if you will reduce the $\frac{2}{3}$ and the $\frac{1}{4}$ of $\frac{1}{3}$, you must doe as before, set downe the $\frac{2}{3}$ & $\frac{1}{4}$, with a crosse

betweene

betweene them, then multiply ye two denominators the one by the other, yt is to saye 3 by 4, maketh 12: which set vnder ye crosse, as you see in the margent: and then multiply ye firste numerator 2, by the laste denominator 4, and thereof commeth 8, whereunto adde the laste numerator 1, & that maketh 9: whiche 9 set ouer ye Crosse: so shall you fynde that the $\frac{2}{3}$ and the $\frac{1}{4}$ of $\frac{1}{3}$, are worthe $\frac{9}{12}$, the whiche abreuyed doe make $\frac{3}{4}$, as appeareth by example in the margent.



Reduction of whole numbers and *broken togither into a Fraction, the which fraction is called an improper Fraction.*

If you will reduce whole number & broken, into broke͞, you shall reduce ẏ whole nu͞ber into broke͞, as by this example may appeare: yf you wil reduce 17 $\frac{5}{8}$, into a broken number, first you must multiply the whole number 17 by the denominator of the broken, which is 8, in saying 8 times 17, doe make 136, vnto the whiche you must adde the numerator of $\frac{5}{8}$ whiche is 5, and all amounteth to 141, whiche set ouer $\frac{5}{8}$, with a line betweene them, & they will bee $\frac{141}{8}$ so muche is 17 $\frac{5}{8}$, worth in an improper fraction, as appearth here by practise. *Reduction 6.*

$$\begin{array}{r} 17 \\ 8 \\ \hline 136 \\ 5 \\ \hline 141 \end{array} \quad\Bigg|\quad \begin{array}{c} 141 \\ \hline 17\frac{5}{8} \end{array} \quad\Bigg|\quad \text{maketh } \frac{141}{8}$$

In case you haue whole number & broken, to be reduced with broke͂, you must bringe the whole nu͂ber into his broken, in multiplying it by the denominator of the broken number going therewith, and adde ther vnto the numerator of the saide broken number, as in the last example is declared, and then reduce that broken number with the other broken, as heare appeareth by this example. Reduce 10, $\frac{2}{3}$ and $\frac{4}{7}$ togither, firste bringe 10 $\frac{2}{3}$ all into thirds, as it is taughte by the sixte reduction, and you shall finde $\frac{32}{3}$, then reduce the $\frac{32}{3}$ and $\frac{4}{7}$ togither, by the first reduction, and you shall find $\frac{224}{21}$ for the $\frac{32}{3}$: and $\frac{12}{21}$ for $\frac{4}{7}$ as appeareth here by practise.

$\frac{32}{10\frac{2}{3}}$	$\frac{224}{\frac{32}{3}}$	$\frac{12}{\frac{4}{7}}$	32.	4.
			7.	3.
			224	12

21

Also in case you haue in both partes

of

of your reduction, as well whole number as broken, you must alwaies put the whole of each part into his brokẽ as by the 6 reduction is taught.

¶ *Example.*

If you will reduce 12 $\frac{1}{4}$ with 14 $\frac{2}{3}$ to bring them into one denominatiõ, first bring the 12 $\frac{1}{4}$ all into fourthes, and you shal find $\frac{49}{4}$: then likewise reduce 14 $\frac{2}{3}$, all into thirdes, & you shall haue $\frac{44}{3}$, for the 14 $\frac{2}{3}$: then reduce $\frac{49}{4}$ and $\frac{44}{3}$ togither, by the order of ye first reduction, and you shall finde $\frac{147}{12}$ for the $\frac{49}{4}$. And $\frac{176}{12}$ for the $\frac{44}{3}$: as here by practise doth plainely appeare.

$$\frac{49}{12\frac{1}{4}} \;\Big|\; \frac{44}{14\frac{2}{3}} \;\Big|\; \frac{147}{\frac{49}{4}} \;\times\; \frac{176}{\frac{44}{3}}$$

12

In case you haue whole number & broken, to be reduced with brokē, you must bringe the whole nūber into his broken, in multiplying it by the denominator of the broken number going therewith, and adde ther vnto the numerator of the saide broken number, as in the last example is declared, and then reduce that broken number with the other broken, as heare appeareth by this example. Reduce 10, $\frac{2}{3}$ and $\frac{4}{7}$ togither, firste bringe 10 $\frac{2}{3}$ all into thirds, as it is taughte by the sixte reduction, and you shall finde $\frac{32}{3}$, then reduce the $\frac{32}{3}$ and $\frac{4}{7}$ togither, by the first reduction, and you shall find $\frac{224}{21}$ for the $\frac{32}{3}$: and $\frac{12}{21}$ for $\frac{4}{7}$ as appeareth here by practise.

$\frac{32}{10\frac{2}{3}}$ | $\frac{224}{\frac{32}{3}}$ $\qquad$ $\frac{12}{\frac{4}{7}}$ $\qquad$ $\begin{array}{rr} 32. & 4. \\ 7. & 3. \\ \hline 224 & 12 \end{array}$

21

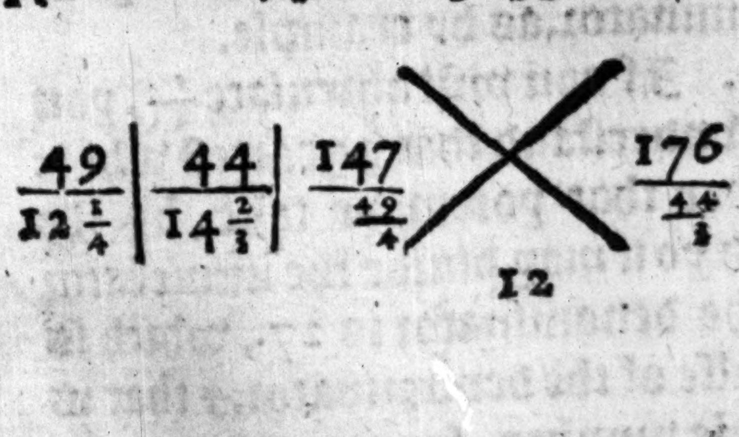
Also in case you haue in both partes

of

of your reduction, as well whole num ber as broken, you muſt alwaies put the whole of each part into his brokē as by the 6 reduction is taught.

¶ Example.

If you will reduce 12 $\frac{1}{4}$ with 14 $\frac{2}{3}$ to bring them into one denominatiō, firſt bring the 12 $\frac{1}{4}$ all into fourthes, and you ſhal find $\frac{49}{4}$: then likewiſe re duce 14 $\frac{2}{3}$, all into thirdes, & you ſhall haue $\frac{44}{3}$, for the 14 $\frac{2}{3}$: then reduce $\frac{49}{4}$ and $\frac{44}{3}$ togither, by the order of yͤ firſt reduction, and you ſhall finde $\frac{147}{12}$ for the $\frac{49}{4}$. And $\frac{176}{12}$ for the $\frac{44}{3}$: as here by practiſe doth plainely appeare.



The third chapter treateth of abbreuiation of one broken number into a lesser broken.

ABbreuiation is as much as to set downe, or to write a broken number by figures of lesse signification, and not diminishinge yͤ value therof. The which to do, there is a rule whose operation is thus, diuide the numerator and likewise the denominator, by one whole number, the greatest that you may finde in the same brokē number. and of the quotiēt of that numerator, make it the numerator, and likewise of that of yͤ denominator, make it your denominator, as by example.

1. If you will abreuiate $\frac{54}{81}$, you shall vnderstand that yͤ greatest whole number that you maye take, by the which you may diuide the numerator and the denominator is 27, which is the halfe of the denominator, & that is a whole number, for you cannot take a whole number out of the denomina

tor 81, which will diuide both the numerator & denominator, but that ther will bee eyther more or lesse then a whole number, therfore if you diuide 54 by 27, you shall finde in the quotient 2 for the numerator: likewise if you diuide 81 by 27, you shal haue in the quotient 3 for the denominator: then put 2 ouer the 3, with a lyne betwene them, and you shall finde $\frac{2}{3}$, and thus by this rule the $\frac{54}{81}$ are abreuyed vnto $\frac{2}{3}$: as apeareth in ye margent, and so is to be vnderstanded of all other.

$\frac{54}{81}$

$\cancel{1}\,\cancel{0}$
$\cancel{8}\,\cancel{4}$ (2
$\cancel{2}\,\cancel{7}$

$\frac{2}{3}$

$\cancel{2}\,\cancel{0}$
$\cancel{8}\,\cancel{1}$ (3
$\cancel{2}\,\cancel{7}$

The forme and manner how to finde *the greater number, by the which you may wholy diuide the numerator and denominator, (to the ende ye may abbreuiat them) is thus.*

First diuide the denominator by his numerator, and if any number doe remaine, let your diuisor bee diuided by the same number, and so you must continue vntill you haue so often times diuided, yͭ there may nothing remaine, then is it to be vnderstande, that your last diuisor (whereat you did ende, and that o did remaine after youre last diuision) is the greatest number, by the which you must abreuiat, as you did in the last example. But in case yͭ your last diuisor be 1, it is a token that the same number cannot be abreuied to any lower fraction thẽ you finde it at yͤ first. *Example* of $\frac{54}{81}$: diuide 81, whiche is yͤ denominator by 54 whiche is his numerator, and there resteth 27, then diuide 54 by 27, and there remaineth a o, which is nothinge, wherfore your

last

laste diuisor 27 is the number by the which you must abreuiat $\frac{54}{81}$: as in the last example is specified.

¶ Another maner of abbreuiation.

2. Mediate the numerator, and also the denominator of youre Fraction in case the numbers be euen, that is to saye, take alwaies the halfe of the numerator, and likewise of the denominator, and of the mediation or halfe of the numerator, make it your numerator, also of halfe ye denominator make your denominator, & so cõtinue as often as you may in taking alwaies the halfe of the numerator, & likewise of ye denominator: or els see if you may abreuiate the numbers whiche doe remaine, by 3: by 4: by 5: 6: 7: 8: 9: or by 10: for you must abreuiate them as often as you can by any of the said numbers. And it is to bee noted, that with what soeuer nũber of these, you doe abbreuiate the numerator of your fraction, by the same you must abbreuiate

niate likewiſe the denominator, ſo con
tinuinge vntill they canne no more be
abbreuied. And it is to be vnderſtand,
that if the Numerator and the Deno-
minator be euē numbers, as you may
know when the firſt fygure is an euē
number, or a 0 then may you perceaue
if both the Numerator and the Deno-
minator may be abbreuied by 10, by 8
by 4, or by 2: albeit that ſometimes
they maye bee abbreuied by 3. And if
they be odde numbers, then muſt you
conſider if they may be abbreuied by 9
by 7, by 5, or by 3: but when the firſt
number, as well of the numerator, as
of the denominator are euē numbers,
then maye you well know that ſuche
numbers may be abbreuied by 2, as is
aforeſaid. And if you adde the figures
of yͤ numerator together, in ſuch ma-
ner as you doe in makinge the proofe
by 9 in whole numbers: that is, if you
finde 9: it appeareth that you maye
abbreuy that number by 9. And like-
wiſe by 3, and ſometimes by 6, if you
finde 6 it maye be abbreuied by 6, and

alwaies by 3 if you find 3, it is a signe that you abbreuiate by 3, And by what soeuer number that you do abbreuiate the numerator, by the same muste you abbreuiate likewise the denominator, and if the first figures of the same nūber be 5, or 0 you may abbreuiate them by 5, but if ye first figurs be both 0, they may be abreuied 10: in cuttinge away the two Ciphers thus, as $\frac{2}{3}|\frac{0}{0}$ whiche maketh $\frac{2}{3}$, & sometimes by 100, thus, as $\frac{1}{2}|\frac{00}{00}$, in cuttinge away the foure ciphers after this sorte, $\frac{1}{2}|\frac{00}{00}$ and then the $\frac{100}{200}$ doe make $\frac{1}{2}$, and after this maner haue I set here diuers examples although that all broken numbers cānot be abbreuied by this rule, yet all fractions may be well abbreuied by the fyrst rule afore saide.

Abreuied.

$\frac{3840}{7680}$	by 10.	$\frac{1890}{4725}$	by 9.
$\frac{384}{768}$	by 8.	$\frac{210}{525}$	by 7.
$\frac{48}{96}$	by 6.	$\frac{30}{75}$	by 5.
$\frac{8}{16}$	by 4.	$\frac{6}{15}$	by 3.
$\frac{2}{4}$	by 2.	$\frac{2}{5}$	
$\frac{1}{2}$			

3. Furthermore you shall vnderstande that sometimes it happeneth, that all the figures of the numerator are equall vnto them of the denominator, whiche when it so happeneth, you may then take one of them of the numerator, and also one of them of ye denominator, and it shall be abreuied as $\frac{555}{888}$, beyng abreuied after this mā-ner commeth to $\frac{5}{8}$. And yet it happeneth sometimes, that two or many figures of the numerator are proportioned vnto two, or many fygures of their denominators, and that the other fygures of the same number are the

fygures

one to the other in this proportiō following. Then may you take two or more fygures, as wel of ỳ numerator, as of the denominator, & by this manner ỳ same number shall be abbreuied, as $\frac{4747}{5959}$ beynge abreuied by this rule, doe come to $\frac{47}{59}$.

4. Also it happeneth sometimes, that you would abreuiate one number vnto the semblance or likenesse of an other: And for to knowe if the same may bee abreuied, and also by what number it may be abreuied, you must diuide the numerator of the one number by the numerator of the other: and likewise the denominator of the one, by the denominator of the other, for in case that after euery diuision there doe remayne 0, and that ỳ two quotients be equall, thē is one of them the number by the which the sayd fractiō must be abreuied, as by example of $\frac{115}{207}$. I would know if they maye bee abreuied vnto $\frac{5}{9}$, and for to doe this, you must diuide a 115 by 5, and you must dyuide 207 by 9, and there will

come into bothe the quotients 23 : by the which it appeareth that this number may be abreuied by 23.

$\cancel{1}\cancel{0}$

$\frac{115}{207}$ $\cancel{1}\cancel{1}5$ $\cancel{2}\cancel{0}$

$\frac{5}{9}$ $\cancel{5}\cancel{5}$ (23 $\cancel{2}\cancel{0}\cancel{7}$

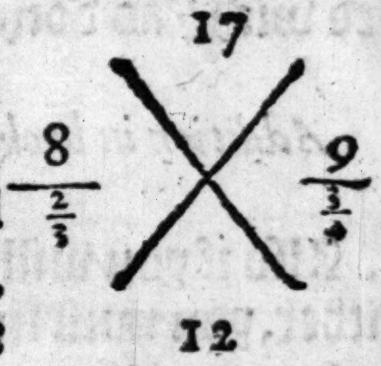
$\cancel{0}\cancel{0}$ (23

The 4. Chapter treateth of the addinge of two or many broken numbers together, as by example.

For to adde Fractions or brokē numbers together, there is a generall rule, which is thus. If the numbers be of vnlike denominations the one to the other, you must reduce them into a common denomination by the doctrine of the first reductiō : and whē you haue reduced them, you must then adde bothe the numerators together, and set the product of the saide addition ouer the crosse, and diuide the same Numerator by the common denominator

nator, as by this example folowinge.

1. If you will adde $\frac{2}{3}$ with $\frac{3}{4}$, you must firste reduce the two fractions both into one denominatiō, accordinge to the order of the first reduction, that is to say, in multiplyinge the denominator of the first fraction whiche is 3, by the denominator of the other fraction whiche is 4, and they make 12 for your common denominator: the which 12 you shal set vnder ye crosse, then multiply the first numerator 2 by the last denominator 4: & there of cōmeth 8, which set ouer the $\frac{2}{3}$, and



$$\begin{array}{l} 5 \\ \cancel{1}\cancel{7} \\ \cancel{1}\cancel{2} \end{array} \quad (1\tfrac{5}{12}$$

then multiply the last numerator 3, by the firste denominator 3, and thereof commeth 9, whiche you must set ouer the $\frac{3}{4}$: then adde the numerator 8, wt the numerator 9, and they make 17, whiche set ouer the crosse, & then your

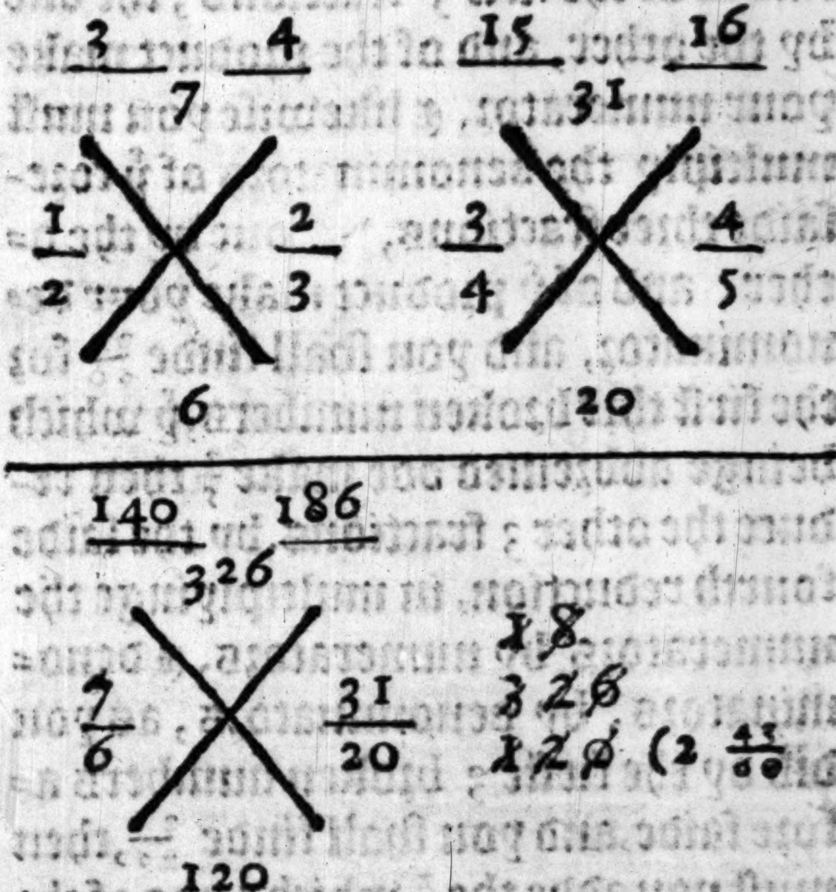
fraction

fraction will be $\frac{17}{12}$: whiche is the addition of the $\frac{2}{3}$ with $\frac{3}{4}$. And bycause the numerator 17, is greater then his denominator 12, therefore you must diuide 17 by 12: and thereof will come 1, & 5 remayninge, whiche 5 you must set aparte, and 12 vnder the same, with a line betweene them, and they are worth $\frac{5}{12}$, and so muche are the $\frac{2}{3}$ added with $\frac{3}{4}$ as dothe appeare.

Addition in broken numbers.

2. Also if you will adde $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$ and $\frac{4}{5}$ togither, you must first adde the $\frac{1}{2}$ & $\frac{2}{3}$, together accordinge to ye doctrine of ye last rule, & you shall finde $\frac{7}{6}$: then adde $\frac{3}{4}$ and $\frac{4}{5}$ togither by the saide last rule, and they make $\frac{31}{20}$. Then finally adde ye $\frac{7}{6}$ (which came of the $\frac{1}{2}$ and $\frac{2}{3}$ added togither) with $\frac{31}{20}$, which came of the $\frac{3}{4}$ and $\frac{4}{5}$ added togither, and you shall fynde by the foresaide addition that they amounte vnto $\frac{326}{120}$. wherefore diuide 326 by 120 and thereof commeth 2 & 86 remaineth which is $\frac{86}{120}$ of one

one whole, and they beinge abbreuied do make $\frac{43}{60}$ and thus the $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, and $\frac{4}{5}$ beinge added togither do amounte to 2 and $\frac{43}{60}$ as here vnder doth appeare.



¶ Additian of broken number of broken.

3. Furthermore, if you will adde the broken numbers of broken togither as

as to adde ẏ $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$ wͭ the $\frac{5}{6}$ of $\frac{1}{2}$ of $\frac{5}{8}$: first you must reduce the numbers accordinge to the order of the fourth reduction, in multiplyinge the numerators of the first 3 fractions, the one by the other, and of the product make your numerator, & likewise you must multiply the denominators of ẏ foresaide three fractions, the one by the other, and of ẏ product make your denominator, and you shall finde $\frac{24}{60}$ for the first thre broken numbers, ẏ which beinge abbreuied doe make $\frac{2}{5}$ then reduce the other 3 fractions, by the saide fourth reduction, in multiplyinge the numerators by numerators, & denominators, by denominators, as you did by the firste 3 broken numbers afore saide, and you shall finde $\frac{25}{96}$, then must you adde the $\frac{2}{5}$ which came of the first 3 broken numbers, and $\frac{25}{96}$ which are come of the last 3 fractions, both togither, by the instruction of the first addition: & you shall find $\frac{317}{480}$: which cannot bee abbreuied, but is the iust product of ẏ addition: so much are $\frac{2}{3}$

of

of $\frac{3}{4}$ of $\frac{4}{5}$ added with the $\frac{5}{6}$ of $\frac{1}{2}$ of $\frac{5}{8}$ as hereafter by practise doth euidentlye appeare.

$$\frac{24}{60}\quad \frac{2}{3},\ \frac{3}{4},\ \frac{4}{5}, \quad \frac{2}{5} \qquad\qquad \frac{25}{96}\quad \frac{5}{6},\ \frac{1}{2},\ \frac{5}{8},$$

$$317$$

$$192 \qquad 125$$

$$\frac{2}{5} \times \frac{25}{96} \qquad \frac{317}{480}$$

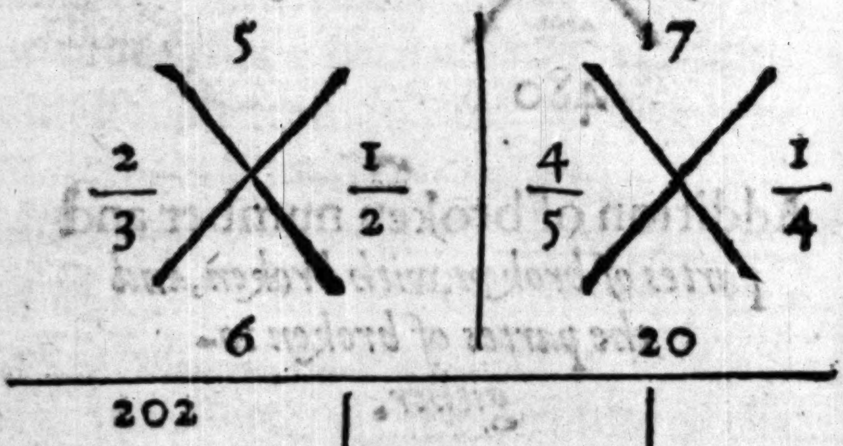
$$480$$

Addition of broken number and *partes of broken, with broken, and the partes of broken togither.*

4. Likewise if you will adde the $\frac{2}{3}$, and the $\frac{1}{2}$ of $\frac{1}{3}$, with the $\frac{4}{5}$ and $\frac{1}{4}$ of $\frac{1}{5}$, you must reduce the $\frac{2}{3}$ $\frac{1}{2}$ first into one fraction by the doctrine of the fifte reduction, and therof commeth $\frac{5}{6}$, for the

$\frac{2}{3}$ and

$\frac{2}{3}$ and $\frac{1}{2}$ of one of the said thirdes: then reduce the $\frac{4}{5}$ and $\frac{1}{4}$ by the saide fift reduction, and thereof commeth $\frac{17}{20}$. Last of all adde the $\frac{5}{6}$ and $\frac{17}{20}$ togither according to the first rule of addition: and you shall fynde $\frac{202}{120}$ which beinge diuided bringeth 1, and $\frac{82}{120}$ part remaining, which abbreuied maketh $\frac{41}{60}$ and thus you doe perceiue that the $\frac{2}{3}$ and $\frac{1}{2}$ of $\frac{1}{3}$, added with the $\frac{4}{5}$ & $\frac{1}{4}$ of $\frac{1}{5}$, do amount vnto 1 $\frac{41}{60}$ as hereafter by practise doth plainely appeare.



Addition of whole number and broken with whole number and broken.

3. Also if you will adde 12 $\frac{4}{5}$ with 20 $\frac{5}{6}$, you may (you may if you will) adde 12 and 20 togither, and they make 32, the whiche you shall sette aparte and then adde the two broken numbers togither, that is to say $\frac{4}{5}$ and $\frac{5}{6}$ by the order of the first additiō, & they make $\frac{49}{30}$: therfore diuide 49 by 30, and there of commeth 1 and $\frac{19}{30}$ partes remaine, which 1 you must adde vnto the 32, which were put apart, and the whole addition wilbe 33 $\frac{19}{30}$. Or otherwise, you may reduce 12 $\frac{4}{5}$ into the likenesse of a Fraction by the order of the syxte reduction, and they will be $\frac{64}{5}$ and like wise by the same reduction, reduce 20 $\frac{5}{6}$ and they be $\frac{125}{6}$, then adde $\frac{64}{5}$ with the $\frac{125}{6}$, by the first addition, and you shall finde $\frac{1009}{30}$. Therefore diuide 1009 by 30, and thereof commeth 33 $\frac{19}{30}$ as before, and as by practise of the same both waies, dothe here after appeare.

peare.

12 $\frac{4}{5}$ 20 $\frac{5}{6}$ 1 33 $\frac{19}{30}$	24 $\frac{4}{5}$	49 × 30	25 $\frac{5}{6}$

1
49 (1 $\frac{19}{30}$
30

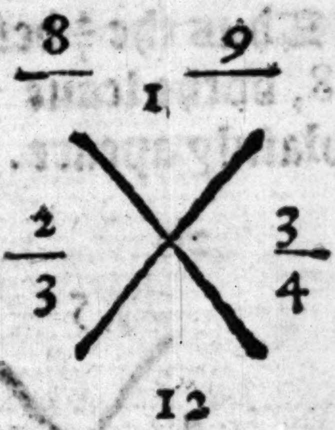
64 12 $\frac{4}{5}$	125 20 $\frac{5}{6}$	384 64 5	1009 × 30	625 125 6

11
1009 (33 $\frac{19}{30}$)
330

The fift Chapter treateth of Subtraction in broken numbers.

1 If you wil subtract $\frac{2}{3}$ from $\frac{3}{4}$, you must first reduce both the fractions, into a common denomination, by the doctrine of the first reduction, and you

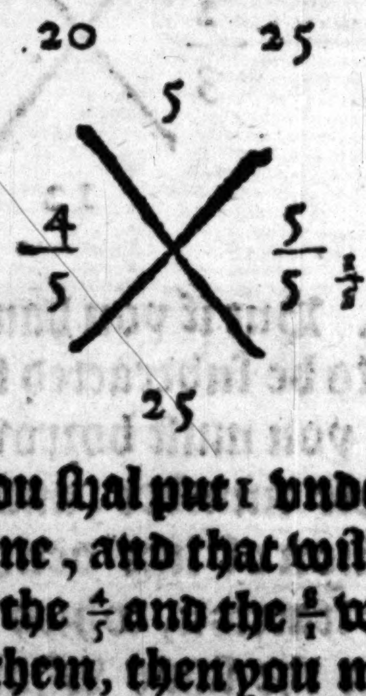
you shall finde $\frac{8}{12}$ for the $\frac{2}{3}$, and $\frac{9}{12}$ for the $\frac{3}{4}$. Therfore abate the numerator 8 frō the numerator 9, and there wil remaine 1, which 1 you muste set ouer the crosse, & the same is $\frac{1}{12}$, & so muche is the rest of that subtraction, as may appere here by practise.



2. But if you haue a broken number to be subtracted from a whole nūber, you must borrowe 1 vnity of the whole number, and resolue it into a fraction of like denomination, as is that fraction, which you would abate from the same whole number, and then abate the sayd fractiō therefrom, & you shall finde what doth remaine as by this example. If you abate $\frac{4}{5}$ frō

8, you must borrow one of the sayde 8, & resolue it into fiftes like vnto ỷ fraction, bicause it is $\frac{4}{5}$, and that 1 will be 5 fiftes thus $\frac{5}{5}$, therefore abate $\frac{4}{5}$ from $\frac{5}{5}$ and there will remaine $\frac{1}{5}$, and subtract the 1 which you borrowed from 8, and there doth remaine 7, and the $\frac{1}{5}$ also which remained after the sayde $\frac{4}{5}$ were abated. Thus the $\frac{4}{5}$ beinge subtracted from 8, dothe leaue 7 $\frac{1}{5}$ as by practise doth plainly apeare.

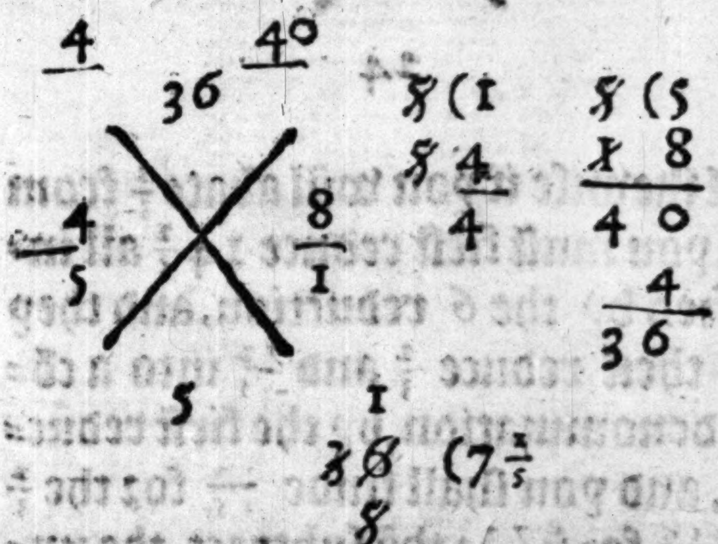
$$\begin{array}{r} 8 \\ 1 \\ \hline 7\frac{1}{5} \end{array}$$



Or otherwise you shal put 1 vnder 8 with a line betwene, and that will be $\frac{8}{1}$: then set down the $\frac{4}{5}$ and the $\frac{8}{1}$ with a crosse betwene them, then you must reduce them into one denomination by the firste reduction, and you shall finde 4 ouer the $\frac{4}{5}$, and 40 ouer the $\frac{8}{1}$,

then

then subtract the saide 4 from 40, and there will remaine 36, the which you shall sett ouer the crosse, and they doe make $\frac{36}{5}$. Likewise you must multiply the denominator 5 by 1, maketh 5, set that vnder the crosse then diuide 36 by 5, and thereof will come $7\frac{1}{5}$ as before, for the rest of that subtraction as here by practise apereth.



3. If you will subtract broken number from whole number and broken: as if you would subtract $\frac{3}{4}$ from $6\frac{5}{6}$, you may by the first subtraction, abate $\frac{3}{4}$ from $\frac{5}{6}$ and there will remaine $\frac{1}{12}$, & the 6 doth still remaine whole, bicause the $\frac{3}{4}$ may well be abated from the $\frac{5}{6}$,

and thus $\frac{3}{4}$ beinge abated from 6 $\frac{5}{6}$ leaueth 6, $\frac{1}{12}$ as appereth by practise.

$$\begin{array}{ll} 6 & \frac{5}{6} \\ 9 & \frac{3}{4} \\ \hline 6 & \frac{1}{12} \end{array}$$

18 2 20

$\frac{3}{4}$ $\frac{5}{6}$ $\frac{1}{12}$

24

Likewise if you will abate $\frac{2}{3}$ from 14 $\frac{2}{5}$, you must first reduce 14 $\frac{2}{5}$ all into fiftes by the 6 reduction, and they be $\frac{72}{5}$ then reduce $\frac{2}{3}$ and $\frac{72}{5}$ into a comon denomination, by the first reduction, and you shall finde $\frac{10}{15}$ for the $\frac{2}{3}$ and $\frac{216}{15}$ for the $\frac{72}{5}$: then subtract the numerator 10 of the first fraction, from 216 of the second fraction, & there remaineth $\frac{206}{15}$. Therefore diuide 206, by 15. and thereof commeth 13 $\frac{11}{15}$, & so much remaines of this subtraction, as may appeare in the next page folowinge.

$$\frac{10 \quad 216}{206}$$

$$\frac{72}{14\ \frac{2}{5}}$$

$$\frac{2}{3} \times \frac{72}{5}$$

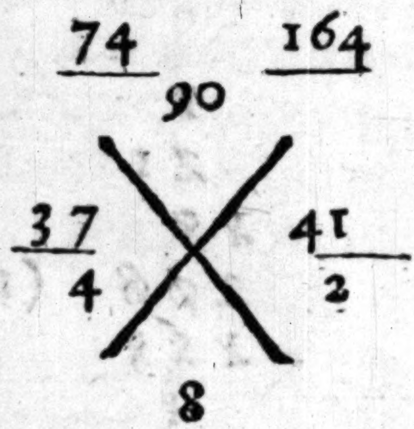
15

1
2̸ 1
1̸ 8̸
2̸ 0̸ 6̸ (13 $\frac{11}{15}$
1̸ 8̸ 8̸
1̸

4. If you will subtract whole number and broken from whole and broken, as thus, if you will subtract 9 $\frac{1}{4}$, from 20 $\frac{1}{2}$, you muste reduce 9 $\frac{1}{4}$ into fourthes, and likewise the 20 $\frac{1}{2}$ into halfes, by the sixte reduction: & you shall finde $\frac{37}{4}$ for the 9 $\frac{1}{4}$: and $\frac{41}{2}$ for ye 20 $\frac{1}{2}$. Then reduce $\frac{37}{4}$, and $\frac{41}{2}$ into one denomination, accordinge unto the first reduction, and you shall finde $\frac{47}{8}$ for the $\frac{37}{4}$, and $\frac{164}{8}$ for the $\frac{41}{2}$ then abate the numerator of $\frac{74}{8}$

which is 74, from 164 which is the numerator of $\frac{164}{8}$ & there remaineth $\frac{20}{8}$, then diuide 90 by 8, and therof cometh $11\frac{1}{4}$ whiche is the remaine of this subtraction.

$\frac{37}{9}\ \frac{1}{4}$ | $\frac{41}{20}\ \frac{1}{2}$ |

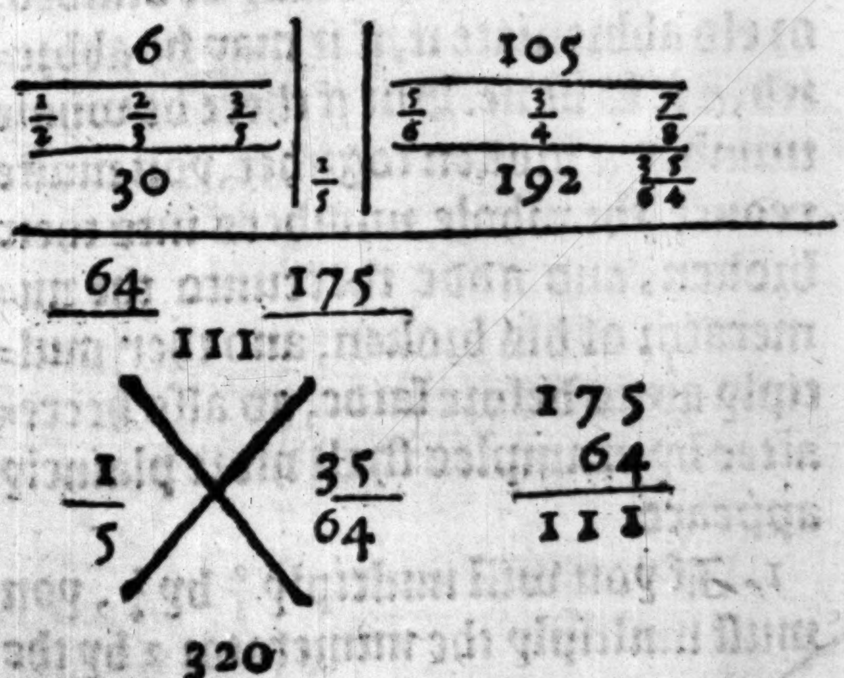


$$\begin{array}{r} 164 \\ 74 \\ \hline 90 \end{array} \qquad \begin{array}{r} \cancel{1}2 \\ \cancel{9}\cancel{0} \\ \cancel{8}\cancel{8} \end{array} \qquad (11\ \tfrac{1}{4}$$

Subtraction of broken numbers of broken from fractions of fractions.

5. If you will subtract the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{5}$, from the $\frac{5}{6}$ of $\frac{3}{4}$ of $\frac{7}{8}$, you must firste bring the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{5}$ into one fraction, by the 3 reduction: and the $\frac{5}{6}$ of $\frac{3}{4}$ of $\frac{7}{8}$, likewise into one fraction by ye same reduction, and you shall fynde $\frac{6}{30}$ for

the first 3 broken numbers, which beinge abbreuied do make $\frac{1}{5}$: and for the other 3 broken numbers, you shall finde $\frac{105}{192}$: whiche beinge likewise abbreuied do make $\frac{35}{64}$, then you shall subtract $\frac{1}{5}$ from $\frac{35}{64}$ by the instruction of the firste subtraction in reducinge both the fractions into a common denomination, as before is done, and you shall finde remaining $\frac{111}{320}$ as may appeare by example.



¶ The sixt Chapter is of multiplication in broken numbers.

First for to multiply in broken number, there is a rule whiche is thus, you muste multiply the numerator, of the one fractiō, by the numerator of ye other. And likewise you must multiply the denominator of the one by the denominator of the other. And then diuide the fractiō if it may be diuided, or els abbreuiate it, if it may be abbreuied, & it is done. But if there be whole number & broken togither, you muste reduce the whole numbers into their broken, and adde thereunto the numerator of his broken, and then multiply as is before saide, as also heereafter by examples shall more plainely appeare.

1. If you will multiply $\frac{2}{3}$ by $\frac{3}{4}$, you must multiply the numerator 2 by the numerator 3, and thereof commeth 6: for ye numerator. Likewise you muste multiplye the denominators the one

by

by the other that is to say 3 by 4, and therof commeth 12 for the denominator: so that this multiplication cōmeth to $\frac{6}{12}$ which being abbreuied do make $\frac{1}{2}$: and so muche amounteth the multiplication of the $\frac{2}{3}$ by $\frac{3}{4}$ as by practise appeareth.

$$\begin{array}{ccc} & 6 & \\ \frac{2}{3} & \overline{\underline{\qquad\qquad}} & \frac{3}{4} \\ & 12 & \end{array} \qquad \begin{array}{c} 1 \\ \frac{6}{12} \\ 2 \end{array}$$

2. Likewise if you will multiplye a broken number by whole number, or whole number by broken, which is all one, as $\frac{4}{5}$ by 18, or els 18 by $\frac{4}{5}$, you must set 1 vnder 18, thus $\frac{18}{1}$: & thē multiply ẏ numerator 18, by the numerator 4, and thereof commeth 72. Likewise multiply ẏ denominator 5, by the denominator 1, and thereof commeth 5, then diuide 72 by the denominator 5, and therof cōmeth 14 $\frac{2}{5}$: for the whole multiplication. Or otherwise, abate frō 18 his $\frac{1}{5}$ part, which is 3 $\frac{3}{5}$, & there remaineth 14 $\frac{2}{5}$, as hereafter foloweth

72

$$\frac{\frac{4}{5} \;\; 72 \;\; \frac{18}{1}}{5} \qquad \begin{array}{c} \cancel{2} \\ \cancel{7}2 \\ \cancel{8}\cancel{8} \end{array} \;(14\tfrac{2}{5}$$

Or otherwise.

$$\frac{\frac{18}{1} \;\; 18 \;\; \frac{4}{5}}{5} \qquad \begin{array}{c} 3 \\ \cancel{1}\cancel{8} \\ \cancel{1}\cancel{8} \end{array} \;(3\tfrac{3}{5} \qquad \begin{array}{r} 18 \\ \underline{3\;\;\tfrac{3}{5}} \\ 14\;\;\tfrac{2}{5} \end{array}$$

3. Also if you will multiply a whole number, by whole number and brokē, or els whole number and broken by a whole number, whiche is al one, as by example: yf you wil multiply 15 by 16 $\frac{3}{4}$, or els 16 $\frac{3}{4}$ by 15: First reduce 16 $\frac{3}{4}$ all into fourthes, in multiplying 16 by ỹ denominator of $\frac{3}{4}$ whiche is 4, and thereof commeth 64, where vnto adde the numerator 3, and it maketh $\frac{67}{4}$: which multiply by $\frac{15}{1}$ accordinge to the instruction of the laste example, and you shal finde the product of this multiplicatiō to be 251 $\frac{1}{4}$, as by practise in the nexte page followinge doth appeare.

67	1005	67
16 $\frac{3}{4}$	$\frac{67}{4}$ $\frac{15}{1}$	15
	4	335
		67
		1005

2 1
1005(251
444

$\frac{1}{4}$

4. And if you will multiply a broken number, by whole number and brokē, or els whole number and broken by a broken. As by Example, if you will multiply $\frac{1}{4}$ by 18 $\frac{2}{3}$, or els 18 $\frac{2}{3}$ by $\frac{1}{4}$, which is all one: you must reduce the whole number into his broken by the first reduction. And you shall finde $\frac{56}{3}$, which you shall multiply by the $\frac{1}{4}$ after the doctrine of the first multiplication, that is to saye: in multiplyinge the numerator 56, by the numerator of $\frac{1}{4}$, whiche is 1: and it is still 56, bicause 1 dothe neither multiply nor diuide. And likewise you must multiplye the denominator 3, by the denominator 4, and it maketh 12: then diuide 56 by 12, and there of commeth 4 $\frac{2}{3}$. And so much amounteth the multiplication of the saide 18 $\frac{2}{3}$ mul-

$\frac{2}{3}$ multiplyed by $\frac{1}{4}$ as by example.

	56	56	18	
18	$\frac{2}{3}$	$\frac{56}{3}$ $\frac{1}{4}$	56	(4 $\frac{2}{3}$
		12	12	

5. If you will multiply whole nũber and broken, with whole and broken, you must first put eyther whole number into his broken, according to the instruction of the sixt reduction, and then multiply the one numerator by the other, and of the product make your numerator. And likewise multiplye the denominators the one by the other, and therof make the denominator, then diuide the numerator by the denominator, and the quotient shall be the encrease of this multiplication. Example. If you woulde multiply 12 $\frac{4}{5}$ by 6 $\frac{3}{4}$: first by the sixt reduction ẏ 12 $\frac{4}{5}$ will make $\frac{64}{5}$: and the 6 $\frac{3}{4}$ wyll make $\frac{27}{4}$, then multiply the numerator 64, by the numerator 27, and thereof commeth 1728 for ẏ numerator. And then you must multiplye the denomi-

nator

nator 5, by the denominator 4, & they do make 20: then diuide 1728, by 20, and therof commeth 86, for the whole multiplication, as by example

1728

$64 \quad 27 \quad | \quad 64 \quad | \quad 1$

$27 \quad | \quad \cancel{1}\cancel{7}\cancel{2}8$

$12\frac{4}{5} \quad 6\frac{3}{4} \quad | \quad 448 \quad | \quad \cancel{2}\cancel{0}\cancel{0}$ (85 [illegible]

$128 \quad | \quad \cancel{2}$

$20 \quad | \quad 1728$

6. If you will multiply one broken number by many broken numbers, thus: As to multiply $\frac{2}{3}$ by $\frac{5}{7}$ and by $\frac{4}{9}$, you must multiply the numerators of all the fractions, the one by the other, and of the product make the numerator, that is to say, 2 by 5, and they be 10, then 10 by 4, and they be 40 for the Numerator. Likewise you must multiply the denominators the one by the other, that is to say 3 by 7 maketh 21, then 21 by 9 maketh 189, for the denominator: then set 40 ouer ỹ 189 with a line betwene them, and they make $\frac{40}{189}$. And so muche amounteth the

ỹ whole multiplication of the $\frac{2}{3}$ multiplyed by $\frac{5}{7}$ and $\frac{4}{9}$ as by example followinge. And thus is to be vnderstād of all such like.

	2	3	
	5	7	
40	10	21	
$\frac{2}{3}$ $\frac{5}{7}$ $\frac{4}{9}$	4	9	$\frac{40}{189}$
189	40	189	

The 7. Chapter treateth of Diuision in broken numbers.

Note that in Diuision of brokē numbers, you must sette youre diuisor downe firste, next vnto the left hande, and the diuidende or number whiche is to bee diuided allwayes toward the right hand. And then multiply crosse wise, that is to say, the numerator of your diuisor, by the denominator of the diuidende: and the product shalbe the denominator, whiche afterwarde shall bee your Diuisor.

And likewise you must multiply the Denominator of your first number, that is to say of your Diuisor, by the Numerator of the Diuidende, whiche afterwarde shall be the Diuidende, & that muste be set ouer the Crosse, and the denominator vnder ye Crosse, then diuide the numerator by the denominator if it maye be diuided, if not, you must abbreuiate them, as hereafter by examples shall more plainely appere.

1. If you will diuide $\frac{3}{4}$ by $\frac{2}{3}$, you must set the diuisor (which is $\frac{2}{3}$) next to the left hande, and the diuidende $\frac{3}{4}$ toward your right hand, with a crosse betwene them: as maye appeare by this example in ye margent. Then you shall multiplye the numerator of the $\frac{2}{3}$, which is 2 by the denominator of the $\frac{3}{4}$ whiche is 4 and therof cōmeth 8 which shalbe your new diuisor: set that 8 vnder the Crosse, as the denominator: then multiplye the numerator

$$\begin{array}{ccc} & 9 & \\ \frac{2}{3} & \times & \frac{3}{4} \\ & 8 & \end{array}$$

numerator

merator of the diuidende, that is to say of the $\frac{3}{4}$ which is 3 by the denomina-tor of the diuisor, that is to wit, of the $\frac{2}{3}$ whiche is 3 and thereof commeth 9, set the 9 ouer the crosse of the nume-rator: which shalbe nowe the diuidend or number to be diuided. Then finally you shall diuide 9, by 8: and thereof commeth into the quotient 1 $\frac{1}{8}$, and so oftentimes is $\frac{2}{3}$ cōteined in $\frac{3}{4}$, as doth appeare before in the margent. But in case you would diuide $\frac{2}{3}$ by $\frac{3}{4}$, you must likewise set youre diuisor $\frac{3}{4}$ nexte to your left hand, as is before saide. And then procede as is aboue declared, & you shal find that $\frac{2}{3}$ diuided by $\frac{3}{4}$ brin-geth into the quotient $\frac{8}{9}$, whiche can-not be diuided nor abbreuied. Where-fore it appeareth that $\frac{2}{3}$ beinge diuided by $\frac{3}{4}$, bringeth but $\frac{8}{9}$ of one vnitie into the quotient, as doth appeare.

2. Likewise if you will diuide a broken number by a whole number or els a whole number by a broken, as to diuide $\frac{3}{4}$ by 13, you shall put 1 vnder 13, & it will be $\frac{13}{1}$ for your diuisor, set ẏ towarde your lefte hande, and then multiply 13 by 4 accor=dinge to the first diuision, & thereof will come 52, for the denominator, set that vnder the crosse: and multiplye 3 by 1, maketh 3 for the numerator: set that ouer the crosse, and it is $\frac{3}{52}$, as ap=peareth in the margent.

3

$\frac{13}{1}$ $\frac{3}{4}$

52

But if you will diuide 13 by $\frac{3}{4}$, then set the $\frac{3}{4}$ next your left hande, and put one vnder 13 as in the last example, & it is $\frac{13}{1}$ set ẏ toward your righte hande thus, as appeareth in the margent and then worke accor=ding to the doctrine of ẏ first diuision, &

52

$\frac{3}{4}$ $\frac{13}{1}$

3

you shall finde that 13 beinge diuided by $\frac{3}{4}$ bringeth into ye quotient $\frac{52}{3}$ then diuide 52 by 3 and thereof commeth 17 $\frac{1}{3}$, and so oftentimes is $\frac{3}{4}$ conteined in 13, as doth appeare.

21
82
33 (17 $\frac{1}{3}$

3. And if you will diuide whole nūber by whole number and broken, or els whole number & broken by whole number, as to diuide 20 by 5 $\frac{5}{6}$, you shall reduce 5 $\frac{5}{6}$ into broken, by ye sixte reduction, and it maketh $\frac{35}{6}$ for your diuisor, thē put 1 vnder 20, and it will be $\frac{20}{1}$, then shal you multiply 35 by 1, and 20 by 6, as is taught in the other diuisions, and you shall finde $\frac{120}{35}$: thē diuide 120, by 35: and you shal finde in your quotient 3 and $\frac{15}{35}$, ye whiche $\frac{15}{35}$ being abbreuied, is $\frac{3}{7}$, and so manye timesis 5 $\frac{5}{6}$ conteined

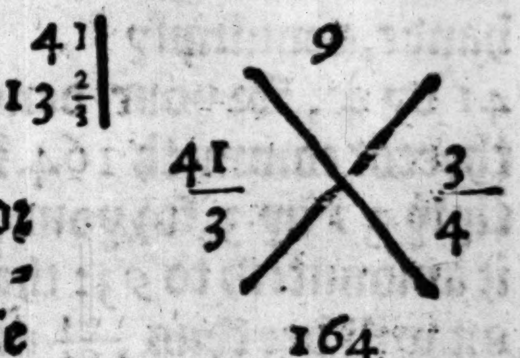
120
$\frac{35}{6}$ $\frac{20}{1}$
35

1
35
120 (3 $\frac{3}{7}$
38

ned in 20 as in ỹ margēt appeareth.

But if you will diuide 5 $\frac{5}{6}$ by 20, you shall haue $\frac{35}{120}$, then you must diuide 35 by 120, whiche you cannot diuide, wherefore you shall abbreuiate $\frac{35}{120}$, and thereof commeth $\frac{7}{24}$ for your quotient.

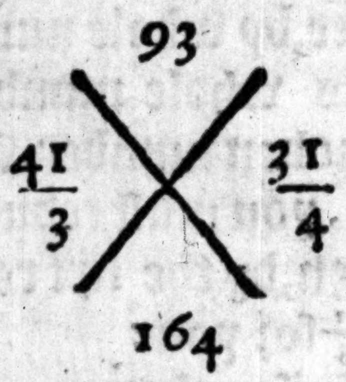
4. If you will diuide a broken nu̅ber, by whole number and broken, or els whole number and broken, by a broken number. As to diuide $\frac{3}{4}$ by 13 $\frac{2}{3}$, you must reduce 13 $\frac{2}{3}$, into his broken, by the sixt reduction and they be $\frac{41}{3}$ for your diuisor, then multiply 41 by 4, & they make 164 for youre denominator, likewise multiply 3 by 3,



and they make 9 for the numerator, & then will your summe be $\frac{9}{164}$ as appeareth in the worke afore noted. But if you will diuide 13 $\frac{2}{3}$ by $\frac{3}{4}$, then you must diuide 164 by 9, and you shall

finde 18 $\frac{2}{9}$.

5. If you will diuide whole number and broken, by whole number & broken, as to diuide 7 $\frac{3}{4}$ by 13 $\frac{2}{3}$, you must reduce the whole numbers into their broken, by the doctrine of the first reduction, and you shall finde $\frac{31}{4}$ for the 7 $\frac{3}{4}$, and $\frac{41}{3}$ for the 13 $\frac{2}{3}$: Then set downe $\frac{41}{3}$ towarde yͤ left hāde, bycause it is youre diuisor, and the $\frac{31}{4}$ towarde the right hande, & multiply



41 by 4, for your denominator: and thereof commeth 164. Likewise multiply 31 by 3, for your Numerator, & it amounteth to 93: the whiche diuision will bee thus $\frac{93}{164}$ as before dothe appeare.

But if you will diuide 13 $\frac{2}{3}$ by 7 $\frac{3}{4}$, you must (contrarywise to the other example) diuide 164, by 93: and you shall finde in the quotient 1 $\frac{71}{93}$.

6. The broken numbers of broken,

must be diuided in such maner as bro- ken numbers are, and there is no dif- ference, sauinge onely that of diuers & manye broken numbers, you muste make but two broken numbers, that is to say, yͤ one for the diuisor, and the other for the diuidend, or number that is to be diuided, example. If you will diuide the $\frac{3}{4}$ of $\frac{3}{5}$ of $\frac{1}{2}$, by the $\frac{2}{3}$ of $\frac{4}{7}$, you must vnderstande, that for the first, the $\frac{3}{4}$ of $\frac{3}{5}$ of $\frac{1}{2}$ are $\frac{9}{40}$ by yͤ third reduction: and the $\frac{2}{3}$ of $\frac{4}{7}$ are by the same reduc- tion $\frac{8}{21}$ thē haue you $\frac{8}{21}$ for your diuisor, & $\frac{9}{40}$ for your number to be diuided, then multiply 8 by 40, whiche maketh 320, set that vnder yͤ crosse and multiply 9 by 21, and thereof commeth 189: whiche set ouer the crosse for the numerator, and they make $\frac{180}{320}$ for this diuisiō, as doth appeare.

$$\begin{array}{ccc} & 189 & \\ \frac{8}{21} & \times & \frac{9}{40} \\ & 320 & \end{array}$$

But if you woulde diuide $\frac{8}{21}$ by $\frac{9}{40}$, you must worke contrary to the laste

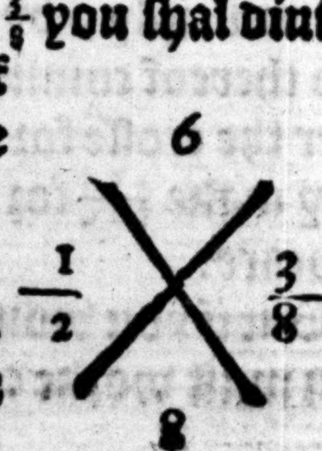
example, yͭ is to say, you must diuide 320, by 189: and therof commeth in yͤ quotient 1 $\frac{131}{189}$.

The eyght Chapter treateth of duplation, triplation, and quadruplation of all broken numbers.

If you will double any broken number, you shal diuide yͤ same by $\frac{1}{2}$: likewise if you will triple any fraction you must diuide it by $\frac{1}{3}$. And for to quadruple any broken number, you shall diuide it by $\frac{1}{4}$, and so is to be understande of all other.

Example of Duplation.

If you will double $\frac{3}{8}$ you shal diuide $\frac{3}{8}$ by $\frac{1}{2}$, and there of commeth $\frac{6}{8}$, whiche being abbreuied are $\frac{3}{4}$: as by example.



Or otherwise, in case the denominator of any fraction be an

euen number, you may take halfe the saide denominator, without any other operation, and the numerator to abide still the numerator, vnto the said halfe of the denominator of the Fraction, as by ỹ other example before rehersed that is to say of $\frac{3}{8}$, take $\frac{1}{2}$ of 8 which is 4, and that is the denominator, and 3 remaineth still numerator to 4: and it it maketh $\frac{3}{4}$ and so of all other. But in case the denominator be an odde number, that is to say, not euen, then you may multiply the numerrtor by 2: or els double the numerator, which is al one thinge, and that fraction shall be doubled. Example if you will double $\frac{3}{5}$ you must onely multiply the numerator 3, by 2, and they be 6: which maketh that fraction to be $\frac{6}{5}$, the whiche 6 beinge diuided by 5 bringeth 1 $\frac{1}{5}$ so much is the double of $\frac{3}{5}$.

Example of triplation.

If you will triple $\frac{3}{5}$ you must diuide $\frac{3}{5}$ by $\frac{1}{3}$ and thereof commeth $\frac{9}{5}$ whiche

beinge diuided, bringeth 1 $\frac{4}{5}$, or other wise, bicause the denominator is an odde number you may multiplye the numerator 3 by 3, and thereof cõmeth 9 which maketh $\frac{9}{5}$ as before appeared.

Example of quadruplation.

If you will quadruple $\frac{4}{5}$, you shall diuide $\frac{4}{5}$ by $\frac{1}{4}$ and thereof commeth $\frac{16}{5}$ which 16 being diuided by 5, bringeth 3 $\frac{1}{5}$ or otherwise, bycause the denominator of ye fractiõ is an odd nũber, you shall multiply the numerator of the $\frac{4}{5}$ that is to say 4, by 4, and therof commeth 16: the which diuide by 5, and you shall finde 3 $\frac{1}{5}$ as before. And this sufficeth for duplacion, triplacion and quadruplacion.

The 9 Chapter treateth of the proues *of broken numbers. And first of reduction.*

If you doe abbreuiate ye broken nũbers whiche bee reduced, you shall retourne

retourne them into their first estate: as by example, if you reduce $\frac{2}{3}$ with $\frac{4}{5}$ you shall finde $\frac{10}{15}$ and $\frac{12}{15}$, then abbreuiate $\frac{10}{15}$ and you shall finde $\frac{2}{3}$, abbreuiate likewise $\frac{12}{15}$ and thereof commeth $\frac{4}{5}$ as before.

The proofe of Abbreuiation.

If you doe multiply that number whiche you haue abbreuied, by that or those numbers, by the whiche you haue abbreuied them, you shal returne them agayne into their firste estate. Example, if you will abbreuiate $\frac{32}{48}$ by 16, in taking the $\frac{1}{16}$ parte bothe of the numerator, and also of the denominator, you shall finde $\frac{2}{3}$, ye proofe is thus, you must multiply bothe the numerator & denominator of $\frac{2}{3}$ yt is to say, 3 by 16, maketh 48 for the denominator, & 2 by 16, maketh 32 for the numerator: then set the numerator 32, ouer the denominator 48, and they be $\frac{32}{48}$ as before.

If you doe subtract one of the numbers, or many of them (whiche you haue added) from the totall summe, there shall remaine ye other, or others. Example: if you do adde $\frac{1}{3}$ with $\frac{1}{4}$, you shall finde $\frac{7}{12}$. The proofe is, if you subtract $\frac{1}{3}$ from $\frac{7}{12}$ you shall finde remayning the other number, whiche is $\frac{1}{4}$, or else if you doe subtract $\frac{1}{4}$ from $\frac{7}{12}$ there will remayne the other number, whiche is $\frac{1}{3}$.

The proofe of Subtraction.

If you doe adde that number which remayneth, with the number whiche you did subtracte, you shall finde the totall summe, out of the whiche you made the abatement: or otherwise, yf you adde the two lesser numbers together, you shall finde the greater. Example: if you doe subtract $\frac{1}{4}$ from $\frac{1}{3}$, there will remayne $\frac{1}{12}$. The proofe is thus: you must adde $\frac{1}{12}$ and $\frac{1}{4}$ together & you shall finde $\frac{16}{48}$ the whiche beyng abbreuied, doth make $\frac{1}{3}$, whiche

is

is the greatest number.

The proofe of Multiplication.

If you diuide the producte of the whole multiplication, by the multiplicator, you shall finde in your quotient, the multiplicande or number ÿ which you haue multiplied: or else if you diuide the totall summe which is come of the multiplication, by the multiplicande: you shall finde in the quotient the multiplicator. Exãple if you multiply $\frac{2}{3}$ by $\frac{4}{5}$, the product of this multiplication will be $\frac{8}{15}$. The profe is thus: you shall diuide $\frac{8}{15}$ by the multiplicator $\frac{4}{5}$, and thereof commeth $\frac{2}{3}$, which is the multiplicande, or els diuide $\frac{8}{15}$ by $\frac{2}{3}$ and you shall finde the $\frac{4}{5}$ whiche is the multiplicator.

The profe of Diuision.

If you doe multiply the quotient by the diuisor, you shall finde the number whiche you did diuide, that is to say, your

your diuidende. Example, if you diuide $\frac{2}{3}$ by $\frac{3}{4}$ your quotient will be $\frac{8}{9}$, the profe is thus, you must multiply $\frac{8}{9}$ by $\frac{3}{4}$, and thereof commeth $\frac{24}{36}$ which being abbreuied are $\frac{2}{3}$, which is your diuidende, and by this maner all whole numbers haue their profes as well as broken numbers.

The tenth Chapter treateth of certaine *questions done by broken numbers. And first by Reduction.*

FInde two numbers, whereof the $\frac{2}{7}$ of the one number, maye be equall vnto the $\frac{3}{8}$ of ye other. *Aunswere.* You shall reduce $\frac{2}{7}$ and $\frac{3}{8}$ crossewise, and you shall finde 16, ouer the $\frac{2}{7}$, and 21, ouer the $\frac{3}{8}$, whiche are the two numbers that you seke: for the $\frac{3}{8}$ of 16 are 6: and so are the $\frac{2}{7}$ of 21, likewise 6: wherefore you may perceaue that the $\frac{3}{8}$ of 16 which are 6, are equall vnto ye $\frac{2}{7}$ of 21, which is also 6.

2. Finde two numbers, whereof ye

$\frac{2}{3}$ of

$\frac{2}{3}$ of the one, may be double to the $\frac{1}{4}$ of the other. *Aunswere*: double $\frac{1}{4}$, & you shall haue $\frac{2}{4}$, whiche beynge abbreuied is $\frac{1}{2}$: then reduce $\frac{2}{3}$ and $\frac{1}{2}$ crossewise, & you shall finde 4 ouer the $\frac{2}{3}$, and 3 ouer the $\frac{1}{2}$, which are the two numbers that you seeke. For the $\frac{2}{3}$ of 3, whiche is 2, is double vnto the $\frac{1}{4}$ of 4, whiche is but 1.

3. Finde two numbers whereof ẏ $\frac{1}{3}$ and the $\frac{1}{4}$ of the one, may bee equall vnto the $\frac{1}{4}$ & $\frac{1}{5}$ of the other. *Aunswere*: Adde the $\frac{1}{3}$ and $\frac{1}{4}$ together, and they make $\frac{7}{12}$, then adde $\frac{1}{4}$ and $\frac{1}{5}$ together, & they are $\frac{9}{20}$: then reduce $\frac{7}{12}$ and $\frac{9}{20}$ crossewise, and you shall haue 140 ouer the $\frac{7}{12}$, and 108 ouer the $\frac{9}{20}$, which are the two numbers that you seeke. For 63 whiche are the $\frac{7}{12}$ of 108, are also the $\frac{9}{20}$ of 140.

4. Finde two numbers, whereof ẏ $\frac{1}{2}$ the $\frac{1}{3}$ and the $\frac{1}{4}$ of the one of them, may be equall vnto the $\frac{1}{5}$ the $\frac{1}{6}$ and $\frac{1}{7}$ of the other number. *Aunswere*: firste you must adde $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ together, & they make $\frac{13}{12}$: then adde $\frac{1}{5}$, $\frac{1}{6}$ and $\frac{1}{7}$ together

gether, and they make $\frac{107}{210}$. Then reduce $\frac{11}{12}$ and $\frac{107}{210}$ crossewise, as by the firste question of reduction, and you shall finde 2730 ouer the $\frac{11}{12}$, & 1284 ouer the $\frac{107}{210}$, whiche are the two nūbers that you seeke: for 1391 whiche is the $\frac{1}{2}$ the $\frac{1}{3}$ the $\frac{1}{4}$ of 1284: is like to the $\frac{1}{5}$, $\frac{1}{6}$ and $\frac{1}{7}$ of 2730, whiche is also 1391.

5. Finde three numbers, whereof the $\frac{2}{5}$ of the first, the $\frac{3}{7}$ of the seconde, & the $\frac{4}{9}$ of the thirde, may be equall the one to the other. *Answere*: set downe the $\frac{2}{5}$, $\frac{3}{7}$ and $\frac{1}{4}$, and then multiply the Denominator of the $\frac{2}{5}$, that is to say 5 by the numerators of the other two Fractions, that is to say, by the numerator of $\frac{3}{7}$, and by the numerator of $\frac{4}{9}$, whiche is 3 and 4, & thereof commeth 60 for your firste number: then shall you multiply the Denominator of the $\frac{3}{7}$ whiche is 7, by the numerators of $\frac{2}{5}$ and $\frac{4}{9}$, that is to say, by 2 and 4, and thereof commeth 56, for the seconde number. Then multiply the denominator of $\frac{4}{9}$, that is to say, 9

by

by the numerator of $\frac{2}{5}$ and $\frac{3}{7}$ that is by 2 and by 3, and thereof commeth 54 for the thirde number. And thus the $\frac{2}{5}$ of 60, whiche is 24: is likewise the $\frac{3}{7}$ of 56, whiche is the second number, and is also the $\frac{4}{9}$ of 54, whiche is the thirde number.

6. Finde three numbers, of whiche the first and the seconde may be in such proporcion as $\frac{1}{2}$ & $\frac{1}{3}$, and the seconde & thirde in such proportion as $\frac{1}{4}$ and $\frac{1}{5}$. *Aunswere*: reduce $\frac{1}{2}$ and $\frac{1}{3}$ crossewise, and you shall haue 3 ouer the $\frac{1}{2}$, and 2 ouer the $\frac{1}{3}$, then reduce $\frac{1}{4}$ and $\frac{1}{5}$ in like maner, and you shall finde 5 ouer the $\frac{1}{4}$, and 4 ouer the $\frac{1}{5}$. Then saye by the Rule of three, if 5 do gyue me 4, what shall 2 gyue me, which is the seconde proportionall, multiplye the seconde number 4, by the thirde number 2, and thereof commeth 8, the whiche diuide by the first number 5, & thereof commeth 1 $\frac{3}{5}$ for the thirde proportionall: and you shall finde that 3, 2, 1 $\frac{3}{5}$ are the three numbers proportionall that I demaunde, or else 15, 10, and 8,

in

in whole numbers

¶ Questions done by addition in fractions.

VVhat number is that, unto the which if you doe adde 13, ỷ whole amounteth to 31? *Aunswere* subtract 13 from 31, & there will remaine 18 which is ỷ nūber ỷ you seke.

2. what number is that, unto the which if you adde $\frac{2}{5}$, the addition will be $\frac{5}{6}$? *Aunswere.* Abate $\frac{2}{5}$ from $\frac{5}{6}$, and there will remaine $\frac{13}{30}$, whiche is the number that you desire.

3. what nūber is that, whereunto if you adde $7\frac{2}{3}$, the whole addition will be $12\frac{1}{4}$? *Aunswere.* Abate $7\frac{2}{3}$ from $12\frac{1}{4}$, and the remaine will be $4\frac{7}{12}$ which is the number that you desire to know.

4. what number is that where unto if you adde the $\frac{3}{4}$ of it selfe, that is to say, of the number that you seeke, the whole addition may be $\frac{5}{6}$? *Aunswere.* Here foloweth a generall rule

for

for all such like questions. First of 3, which is the numerator of $\frac{3}{4}$ make ye still the numerator: and likewise of 3 and 4 added togither, which is both ye numerator, and the denominator: of ye $\frac{3}{4}$, make them your denominator: so you shall finde $\frac{3}{7}$: then take the $\frac{3}{7}$ of $\frac{5}{6}$ which is $\frac{15}{42}$ or $\frac{5}{14}$, and subtract them frõ $\frac{5}{6}$, and there wil remaine $\frac{10}{21}$, which is the number that you seeke.

5. What number is that, unto the which if you adde his owne $\frac{2}{3}$, that is to say $\frac{2}{3}$ of it selfe, the whole addition shall bee 20? *Answere.* doe as in the laste question, of the numerator of $\frac{2}{3}$, that is to say, of 2: make still your numerator: and likewise of ye numerator 2 and the denominator 3, of ye $\frac{2}{3}$: make of them both, your denominator: and you shall finde $\frac{2}{5}$, then take the $\frac{2}{5}$ of 20 which are 8, & abate them from 20, & there will remaine 12: whiche is the number that you desire. And so is to be done of all suche like reasons.

What number is that, from the which if you do abate 17, the reste may be 19? *Aunswere*: adde 17, and 19 togither, and you shall finde 36, which is the number that you seke.

2. What number is that, from the which if you abate $\frac{1}{5}$, the rest maye be $\frac{1}{8}$? *Aunswere*. adde $\frac{1}{5}$ and $\frac{1}{8}$ togither: and you shal finde $\frac{29}{40}$ which is the nūber that you demaunde.

3. What number is that, from the which if you deduct $13\frac{1}{2}$, the rest may be $5\frac{5}{7}$? *Aunswere*: adde $13\frac{1}{2}$ and $5\frac{5}{7}$ together, and thereof commeth $19\frac{3}{14}$ which is the number that you seke.

4. What number is that, from the which if you subtract his $\frac{2}{5}$, that is to say $\frac{2}{5}$ of it selfe, the reste maye bee 12? *Aunswere*: and a rule for, such like reasons: that is to say, from the denominator of $\frac{2}{5}$ which is 5 abate 2 which is his numerator: and there resteth 3 for the denominator, and thus of $\frac{2}{5}$ you haue now made $\frac{2}{3}$: then take the $\frac{2}{3}$ of

12 which are 8 and adde them vnto 12, and thereof commeth 20, for the number which you desire.

5. What number is that, from the which if you doe abate his $\frac{3}{4}$, the rest may be $\frac{8}{9}$? *Aunswere* from the denominator of $\frac{3}{4}$ which is 4: subtract his numerator 3 and there resteth 1, thus of $\frac{3}{4}$ you haue made $\frac{3}{1}$? Then multiply $\frac{3}{1}$ by $\frac{8}{9}$ and thereof commeth $2\frac{2}{3}$, the which adde vnto $\frac{8}{9}$, and you shal haue $3\frac{5}{9}$: whiche is the number that you seke.

6. What number is that, from the which if you abate his $\frac{4}{5}$, the rest maye be $12\frac{2}{3}$? *Aunswere.* Doe as you did in the last question, and you shall find that the $\frac{4}{5}$ will be $\frac{4}{1}$. And therfore multiplye $12\frac{2}{3}$ by $\frac{4}{1}$, and thereof commeth $50\frac{2}{3}$, the which adde vnto $12\frac{2}{3}$, and you shall finde $63\frac{1}{3}$, for the number that you demaunde. And thus of all such like questions.

What number is that, which being multiplied by 13, the whole product of that multiplication ſhall make 221: *Answere*: diuide 221 by 13 and therof commeth 17: which is the number that you ſeke.

2. What number is that which being multiplied by 15, the whole multiplication will amounte to $\frac{3}{4}$: *Answere*: diuide $\frac{3}{4}$ by $\frac{15}{1}$ and thereof commeth $\frac{1}{20}$ which is the number that you ſeke.

3. What number is that, which beinge multiplied by 21 the whole multiplication will be $16\frac{4}{5}$: *Answere* diuide $16\frac{4}{5}$ by $\frac{21}{1}$, and you ſhall finde $\frac{4}{5}$ which is the nũber that you demaũde

4. What number is that which beinge multiplied by $\frac{3}{4}$ the multiplication will amounte to 18: *Answere*, diuide $\frac{18}{1}$ by $\frac{3}{4}$, and thereof commeth 24: which is the number that you deſire to know.

5. What number is that which if

it be multiplied by $\frac{2}{3}$ the whole multiplication will be $\frac{1}{4}$? *Answere* diuide $\frac{1}{4}$ by $\frac{2}{3}$ and the quotient wilbe $\frac{3}{8}$ which is the number that you require to know.

6. what number is that which being multiplied by $\frac{5}{8}$, the product of the multiplication will bee 16 $\frac{2}{3}$? *Answere*, diuide 16 $\frac{2}{3}$ by $\frac{5}{8}$ and thereof cometh 26 $\frac{2}{3}$, which is the number that you seke.

Here ensueth other necessary questions, *which are wrought by Multiplication in broken numbers.*

I Demaunde howe muche the $\frac{5}{8}$ of 20 shillinges are worth, or what are ye $\frac{5}{8}$ of 20 shillinges? *Answere* you must multiply $\frac{5}{8}$ by $\frac{20}{1}$ and the product will be $\frac{100}{8}$, therfore diuide 100 by 8, and there of commeth 12 $\frac{1}{2}$ which is to say 12 s 6 d: and so muche are the $\frac{5}{8}$ of 20 shillinges worth.

2. I demaunde what the $\frac{3}{4}$ of $\frac{5}{6}$ of a pounde of money are worth? that is

to say of 20 s̃. *Aunswere*: multiplye $\frac{3}{4}$ by $\frac{5}{6}$, and thereof commeth $\frac{5}{8}$: Then take the $\frac{5}{8}$ of 20 shillinges, as in the laste question goinge before, and you shall finde 12 s̃. 6 pence, and so much are the $\frac{3}{4}$ of $\frac{5}{6}$ of 20 s̃. worth.

3. I demaunde what the $\frac{2}{3}$ of 8 d. $\frac{1}{2}$ are worth? *Answere*: multiplye 8 $\frac{1}{2}$ by $\frac{2}{3}$, or els $\frac{2}{3}$ by 8 $\frac{1}{2}$, which is all one: and you shall finde $\frac{34}{6}$. Then diuide 34 by 6, and your quotient will be 5 pence $\frac{2}{3}$, and so muche are the $\frac{2}{3}$ of 8 d. $\frac{1}{2}$ worth.

4. What are the $\frac{3}{4}$ of 14 pence $\frac{3}{5}$? *Aunswere*: multiply 14 $\frac{3}{5}$, by $\frac{3}{4}$, and thereof commeth $\frac{219}{20}$: Therefore diuide 210 by 20, and your quotient will be 10 pence $\frac{19}{20}$: and so much are the $\frac{3}{4}$ of 14 $\frac{3}{5}$.

5. How many quarters or fourth partes are contained in 7 $\frac{2}{3}$? *Aunswere*: multiply 7 $\frac{2}{3}$ by $\frac{4}{1}$ (bicause one whole containeth 4 quarters) & thereof commeth 30 $\frac{2}{3}$, and so many quarters are in the 7 $\frac{2}{3}$, that is to saye 30 quarters, and $\frac{2}{3}$ of a quarter.

6. How

6. How many thirdes are in $\frac{3}{4}$ and $\frac{1}{2}$, that is to say in, 3 quarters, and $\frac{1}{2}$ of one quarter? which are $\frac{7}{8}$ by the fifte reduction. *Answere*: multitiply $\frac{7}{8}$ by $\frac{3}{1}$ (for bicause that in 1 whole are cōtained 3 thirdes) and therof commeth 2 $\frac{5}{8}$, the which 2 $\frac{5}{8}$ doth signifye $\frac{2}{3}$, and $\frac{5}{8}$ of a thirde: and so many thirdes are in $\frac{3}{4}$ and $\frac{1}{2}$ or in $\frac{7}{8}$, which is all one

Questions done by Diuision in broken number.

1. What number is that, whiche beyng diuided by 17, the quotient wil be 13? *Aunswere*: multiply 17 by 13, and thereof commeth 221, whiche is the number that you seeke.

2. What number is that, whiche beynge diuided by $\frac{3}{4}$, the quotient will be 21? *Aunswere*: multiply $\frac{21}{1}$ by $\frac{3}{4}$, & thereof commeth $\frac{63}{4}$: Then diuide 63 by 4, & thereof commeth 15 $\frac{3}{4}$: whiche is the number that you seeke.

3. What number is that, whiche beyng diuided by $\frac{1}{8}$, the quotient will

be

bee $\frac{2}{3}$? *Answere*: multiply $\frac{2}{3}$ by $\frac{1}{8}$, and thereof commeth $\frac{2}{24}$: which beyng abbreuied are $\frac{1}{12}$, for the nūber whiche you require.

4. What number is that, whiche beyng diuided by $\frac{4}{5}$, the quotient will be $16\frac{2}{3}$? *Answere*: multiply $16\frac{2}{3}$, by $\frac{4}{5}$, and thereof commeth $\frac{200}{15}$. Therefore diuide 200 by 15, & thereof commeth $13\frac{1}{3}$, whiche is the number that you desire to finde.

5. What number is that, whiche beynge diuided by $13\frac{1}{3}$, the quotient will be 20? *Answere*: multiply $\frac{20}{1}$ by $13\frac{1}{3}$, and thereof commeth $\frac{800}{3}$, then diuide 800 by 3, and thereof commeth $266\frac{2}{3}$: for the number whiche you seeke.

6. What number is that, whiche yf it be diuided by $12\frac{1}{2}$, the quotient wil be $\frac{7}{8}$? *Answere*: multiply $12\frac{1}{2}$, by $\frac{7}{8}$, & thereof commeth $\frac{175}{16}$: then diuide 175 by 16, and thereof commeth $10\frac{15}{16}$: for the number whiche you desire.

Other

Other necessary questions done by *Diuision in broken numbers.*

I Demaunde what part 30 is of 70? *Answere*: diuide 30 by 70, whiche you cãnot, for they are $\frac{30}{70}$, but abbreuy thẽ, & they ar $\frac{3}{7}$. Thus 30 are ỹ $\frac{3}{7}$ of 70

2. I demaunde what part 10 is of $16\frac{2}{3}$? *Answere*: diuide $\frac{10}{1}$ by $16\frac{2}{3}$, and thereof commeth $\frac{30}{50}$ which beinge abbreuied are $\frac{3}{5}$. And thus 10 is founde to be $\frac{3}{5}$ of $16\frac{2}{3}$.

3. More $\frac{5}{8}$ of one vnity, what parte are they of 25? *Answere*: diuide $\frac{5}{8}$ by $\frac{25}{1}$, and thereof commeth $\frac{5}{200}$, whiche beynge abbreuied is $\frac{1}{40}$, and thus $\frac{5}{8}$ of 1, is but the $\frac{1}{40}$ of 25.

4. More $\frac{5}{6}$ what part are they of $\frac{7}{8}$? *Answere*: diuide $\frac{5}{6}$ by $\frac{7}{8}$, and you shall find $\frac{40}{42}$ which abbreuied are $\frac{20}{21}$.

5. More $\frac{4}{5}$ of 1, what part are they of $13\frac{1}{3}$? *Answere*: diuide $\frac{4}{5}$ by $13\frac{1}{3}$, and you shall finde $\frac{12}{200}$, which beinge abbreuied are $\frac{3}{50}$: And thus $\frac{4}{5}$ of 1, are the $\frac{3}{50}$ of $13\frac{1}{3}$.

6. More $12\frac{1}{2}$ what part are they of

30?

30? *Answere*, diuide $12\frac{1}{2}$ by $\frac{30}{1}$, and you shall finde $\frac{25}{60}$, which beinge abbreuied are $\frac{5}{12}$ and thus $12\frac{1}{2}$, are the $\frac{5}{12}$ of 30.

7. More, $16\frac{2}{3}$ what part are they of $57\frac{1}{7}$? *Answere*, diuide $16\frac{2}{3}$ by $57\frac{1}{7}$, & therof cōmeth $\frac{350}{1200}$ which beinge abbreuied are $\frac{7}{24}$: and thus $16\frac{2}{3}$ are the $\frac{7}{24}$ of $57\frac{1}{7}$.

8. More $\frac{3}{4}$ and $\frac{2}{3}$ of $\frac{1}{4}$, or 3 quarters and $\frac{2}{3}$ of one quarter, what parte are they of 1? *Answere*, reduce $\frac{3}{4}$ and the $\frac{2}{3}$ of $\frac{1}{4}$ into one broken number by the 5 reduction, and you shall finde $\frac{11}{12}$. And thus the $\frac{3}{4}$, and $\frac{2}{3}$ of $\frac{1}{4}$, are the $\frac{11}{12}$ of 1 whole.

9. More of what number are 9, the $\frac{2}{3}$? *Answere*, diuide 9 by $\frac{2}{3}$, and therof cōmeth $13\frac{1}{2}$: which is the nūber wherof 9 are the $\frac{2}{3}$.

10. More of what number are $\frac{2}{5}$ the $\frac{3}{4}$? *Answere*, diuide $\frac{2}{5}$ by $\frac{3}{4}$, and thereof commeth $\frac{8}{15}$: whiche is the number whereof $\frac{2}{5}$, are the $\frac{3}{4}$ of the same number.

11. More, of what number are $5\frac{3}{4}$ the

the $\frac{3}{7}$? *Answere*, diuide $5\frac{3}{4}$ by $\frac{3}{7}$, and you shal finde $13\frac{5}{12}$ which is ye number whereof $5\frac{3}{4}$ are the $\frac{3}{7}$.

12. More, $9\frac{2}{3}$ what part are they of $33\frac{1}{2}$? *Answere*: diuide $9\frac{2}{3}$ by $33\frac{1}{2}$ and therof commeth $\frac{58}{201}$: and thus $9\frac{2}{3}$ are the $\frac{59}{201}$ of $33\frac{1}{2}$ as appeareth.

The

The thirde parte treateth of certayne briefe rules, called rules of practise, with diuers necessary questions profitable, not alonely for Merchantes, but also for all other occupiers.

The first Chapter.

SOme there be, whiche doe call these rules of practise, briefe rules: for that by them, many questions may bee done with quicker expedition, than by the rule of three. There be others whiche call them the small multiplication, forbycause that the product, is alwayes lesse in quantity, than the number whiche is to bee multiplyed. This practise commeth not in vse, but onely amonge small kindes of numbers, whiche haue ouer them, other numbers that are greater. And this beynge well considered, is

no other thing but to conuerte lesser, and particular kindes of number, into greater: the whiche may be done by ye meanes of diuision, in taking ye halfe, the thirde, the fourth, the fifte, or suche other partes of the summe, whiche is to be multiplyed: as the multiplyer is parte of his greater kynde, and that whiche commeth thereof, is worth as muche (not in quantity, but in his owne forme and qualitie) as yf you did multiply simply the two summes, the one by ye other. And for the better vnderstandinge of suche conuersions, you must haue respect to one of these two considerations: the first is, when one woulde demaunde this question. At 6 d. the yarde of Cotton, what are 18 yardes worthe by the price? It is manifest that they are worth 18 peeces of 6 pence the peece, or 18 halfe shillinges, whiche must bee turned into shillinges, in taking the halfe of 18 s. and they make 9 s. Or otherwise you must consider, that at 1 s. the yarde, ye 18 yardes are worth 18 s, wherefore

at

at 6 d. they shall be but halfe so much. for 6 d. is but the $\frac{1}{2}$ of 1 s. Therefore you must take the $\frac{1}{2}$ of 18 s. and they make 9 s. whiche are worth as muche as 108 d. that is to say, as 18 times 6 pence.

Rule. 1. First, yf you will multiply any nū-ber after this maner, by pēce: whereof the number of the same pence doe not extende vnto 12, and thereof to bringe shillings into the product: you must knowe the aliquot partes of 12, whiche are these: that is to say, 6, 4, 3, 2 and 1. For 6 is the $\frac{1}{2}$ of 12, and 4 is the $\frac{1}{3}$ of 12, 3 is the $\frac{1}{4}$, 2 is the $\frac{1}{6}$, and 1 is $\frac{1}{12}$. Then for. 6 d. which is the halfe of 1 shilling, you must take the $\frac{1}{2}$ of all the number whiche is to be multiplyed: And that which commeth thereof, shalbe shillinges: if there doe remayne 1, it is 6 pence.

An aliquot parte, is any euē part of a shilling or of a pounde, or of any other thing, as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, &c. are called aliquot parts.

For foure pence, you must take the $\frac{1}{3}$ of all the number, that is to be multiplyed: and yf any vnities doe remayne, they shall be thirdes of a shillinge, euery one beynge in value 4 pence.

For

For 3 pence you must take the $\frac{1}{4}$ of al the summe: yf any vnityes doe remaine, they shalbe fourthes of a shillinge, euery one being worth 3 pence. For 2 pence you must take the $\frac{1}{6}$ of all the summe, and if any vnities doe remaine, they shall bee sixt partes of a shillinge, beinge euerye one of them worth 2 pence.

For 1 d. take the $\frac{1}{12}$ of the whole sūme, if any vnities doe remaine, they are the twelueth partes of a shillinge yche of them being in value 1 d. as by these examples folowing doth plainely appeare.

Example. j.

At 6 Pence the yarde.
VVhat are 59 yardes Worthe?

29 shil. 6 Pence.

ij.

At 4 Pence the yarde.
VVhat 82 yardes?

27 shil. 4 Pence.

iij.

At 3 Pence the yarde.
VVhat 97 yardes?

24 shil. 3 Pence.

iiij.

At 2 Pence the yarde.
VVhat 346 yardes?

57 shil. 8 Pence.

v.

At 1 Penie the yarde.
VVhat 343 yardes.

28 shil. 7 Pence.

Here you may see in the first example, that 59 yardes, at 6 pēce the yarde, are worth 29 shillinges 6 d, in takinge ye $\frac{1}{2}$ of 59. And in the seconde example, the 82 yardes at 4 pence the yarde, are worth 27 s. 4 d. in takinge the $\frac{1}{3}$ of 82.

Likewise, in the third example 97 yardes, at 3 pence the yarde bringeth 24 shillinges 3 pence: in taking the $\frac{1}{4}$ of 97. Also in the fourth example 346 yardes, at 2 pence the yarde, maketh 57 shillinges 8 pence, in takinge the $\frac{1}{6}$ of 346. And finally in the fift example: 343 yardes, at 1 d. the yarde amount to 28 shil. 7 d. in takinge the $\frac{1}{12}$ of 343. And so is to be done of all such like, when the nūber of the pence is any of the aliquot partes of 12.

But if the number of the pence be not an aliquot part of 12: you muste reduce them into some aliquot partes of 12: and after the aforesayde maner, you shall make of them two or three productes as nede shall require, and adde them togither into one summe, as 5 d. may be reduced into 4 d. & 1 d. or else into 3 d. and 2 d. For 4 d & 1 d. doo make 5 d. & so do 3 d. & 2 d. ẏ like. wherefore if you will worke by 4, and by 1: you must for 4 d., take first the $\frac{1}{3}$, of the number that is to be multiplied, and for 1 d, take the $\frac{1}{12}$ of whole Rule 2.

summe or rather for 1 d. ye may take ye $\frac{1}{4}$ of the product which did come of the 4 d. bycause that 1 d. is the $\frac{1}{4}$ of 4 d. But if you will worke by 3 d. and 2 d you shall take for 3 d. the $\frac{1}{4}$ of the nũber which is to be multiplied: and likewise for 2 d. the $\frac{1}{6}$ of the same number, addinge togither both the productes: The totall summe of those two numbers shall be the solution to the question. And in like maner is to be done of all others. As by these examples followinge may appeare.

i. Example.

At 5 Pence the yarde.

What will 49 yardes amount vnto?

16 shil. 4 Pence.
4 shil. 1 d.
20 shil. 5 d.

ij.

At 7 d. the lib.
VVhat will 54 lib. coste?

18 shil. 0 d.
13 shil. 6 d.

31 shil. 6 d.

iij.

At 8 d. the peece.
VVhat are 40 worth?

13 shil. 4 d.
13 shil. 4 d.

26 shil. 8 d.

Other wayes.

VVhat are 40 peeces worthe?
At 8 d. the peece.

2|0 shil.
6 shil. 8 d.

26 shil. 8 d.

iiii.

At 9 d. the yarde.
VVhat are 73 yardes?

36 shil. 6 d.
18 shil. 3 d.
54 shil. 9 d.

v.

At 10 d. the elle.
VVhat are 32 elles?

16 shil. 0.
10 shil. 8.
26 shil 8 d.

vi.

At 11 d. the lib.
VVhat are 27 lib?

9 shil. 0.
9 shil. 0.
6 shil. 9.
24 shil. 9 d.

Here in this first example, where it is demaunded (at 5 pence ẏ yarde) what will 49 yardes amounte vnto? First for foure pence, I take the $\frac{1}{3}$ of 49 s. and thereof commeth 16 s. 4 d. then for 1 d. I take the $\frac{1}{4}$ of the same product, that is to say, of 16 s. 4 d. and ẏ bringeth 4 s. 1 d. these two summes added togither, doe make 20 s. 5 d. And so much are the 49 yards worth. at 5 d. the yarde

For 7 d. take the $\frac{1}{3}$ and the $\frac{1}{4}$ of the whole summe whiche is to be multiplied, & adde them togither, ẏ is to say, for 4 d. you must take the $\frac{1}{3}$: & for 3 d. the $\frac{1}{4}$: bicause 4 d. is the $\frac{1}{3}$ of 12 d. & 3 d. is the $\frac{1}{4}$ as in the seconde example before doth appeare, where the question is thus, at 7 d. ẏ li. what will 54 li cost? First for 4 d. I take the $\frac{1}{3}$ of 54: & they make 18 s. Likewise for 3 d. I take $\frac{1}{4}$ of 54, and they are 13 s. 6 d. Then I adde 18 s. and 13 s. 6 d. togither, so bothe amount to 31 s. 6 d. & so much are the 54 li. at 7 d. the li.

Otherwise, for 7 d. you shall take

first the ½ of the whole summe for 6 d. Then for 1 d. you must take the ⅙ of ye same product, and adde them togither, so you shall haue the lyke summe as before.

For 8 pence, you must first take ⅓ of the whole summe for 4 pence: and an other ⅓ for other 4 d, and adde them together: as in the example dothe euidently appeare, where the question is thus, at 8 d. the peece, what are 40 peeces worth? Firste, for 4 d, I take ye ⅓ of 40, whiche is 13 s. 4 d: Agayne, I take another ⅓ for the other 4 pence, whiche is also 13 shillinges & 4 pēce: These two summes beyng added together, doe make 26 shillings, 8 pēce, and so muche are the 40 peces worth, at 8 pence the peece: as in the thirde example abouesayde dothe appeare.

Otherwayes: for 8 pence, you may take firste the ½ of the whole summe for 6 d. Then for 2 d. you shall take ye ⅓ of the product, whiche did come of ye sayd ½, and adde them together: so shal you haue likewise the solution to the question.

question. As in the same thirde example of 40 yardes: I take first the $\frac{1}{2}$ of 40 for 6 d. and thereof commeth 20 s. then for 2 d. I take $\frac{1}{3}$ of the saide product, that is to say of 20 s. which bringeth 6 s. 8 d. these two summes (20 s. and 6 s. 8 d.) I adde togither, & they make 26 s. 8 d. as before.

For 9 d. you must take the $\frac{1}{2}$, and the $\frac{1}{4}$ of the whole summe, and adde them togither: or els for 6 d. take first $\frac{1}{2}$ of the whole summe, then for 3 d. take ye $\frac{1}{2}$ of the same product, bicause 3 d. is ye halfe of 6 d. And 6 d. added with 3 d. bringeth 9 d. as by ye fourth example: where it is demaunded after this sort at 9 d. the yarde: what are 73 yardes worth? First for 6 d. I take the $\frac{1}{2}$ of 73: and thereof commeth 36 s. 6 d. then for 3 d. I take $\frac{1}{2}$ of the same 36 s 6 d. which is 18 shil. 3 d. these two summes I adde togither, and they make 54 s. 9 d. as in the saide fourth example is euident.

For 10 d. take first the $\frac{1}{2}$, then the $\frac{1}{3}$ of the whole summe: and adde them

togither and it is done.

For 11 d. take first $\frac{1}{3}$ for 4 d. secondly, another $\frac{1}{3}$ for other 4 d. and thirdly $\frac{1}{4}$ for 3 d. (of al the whole summe) and adde them togither, and that answereth the question.

Or else for 11 d. take first the $\frac{1}{2}$ for 6 d, then the $\frac{1}{3}$ of the whole summe for 4 d, and finally the $\frac{1}{4}$ of ye laste product for 1 d, addinge them together, and it wilbe like to the other.

Rule 3. Likewise by the same reason, when you will multiply (by shillinges) any number that is vnder 20 s. you shall haue in the product poundes, if you knowe ye aliquot partes of 20, whiche are these: 10, 5, 4, 2 and 1. For 10 is the $\frac{1}{2}$ of 20, 5 is the $\frac{1}{4}$ parte, 4 is the $\frac{1}{5}$, 2 is the $\frac{1}{10}$, and 1 is the $\frac{1}{20}$.

Then for 10 s. whiche is the $\frac{1}{2}$ of a pounde, you must take the $\frac{1}{2}$ of the nūber whiche is to be multiplyed, & you shall haue poundes in the product. If there doe remayne 1, it shalbe worthe 10 shillinges.

For

For 5 shillinges, you must take the $\frac{1}{4}$ of the number whiche is to be multiplyed, and if there doe remayne any vnities, they shalbe fourth partes of a pounde, euery vnity beynge in value 5 s.

For 4 s. you must take the $\frac{1}{5}$ of the number whiche is to bee multiplyed: And if there do remayne any vnities, they shalbe fift partes of a pounde, euery vnity beynge worth 4 shillings.

Example.

At 10 shillinges the Peece.
VVhat are 75 Peeces worthe?

37 *lib.* 10 *shil.*

At 5 shil. the yarde.
VVhat are 89 yardes worth?

22 *lib.* 5 *shil.*

At 4 shil. the elle.
VVhat are 93 elles worthe?

18 *lib.* 12 *shil.*

For

For 2 shillinges, you must take the $\frac{1}{10}$ of the number that is to be multiplyed, wherefore, yf you will take the $\frac{1}{10}$ of any number: you must seperate the laste figure of the same number, (whiche is neerest your right hande) from all ẏ other figures, with a small strike or dashe with a penne. For all ẏ other figures whiche doe remayne towarde your lefte hande from the same figure that you doe seperate, shall be the sayde $\frac{1}{10}$ of a pounde: and that fygure so seperated, towarde your right hande shalbe so many peeces of 2 shillings the peece: the whiche figure must be doubled, to make thereof shillings, as by these examples appeareth.

At 2 shil. the lib.
VVhat are 9|8 lib. Worth?

9 lib. 16 shil.

At 2 shil. the dosen.
VVhat are 40|3 dosens worth?

40 lib. 6 shillinges.

Hereupon

Here vppon depẽdeth another exact way for to multiplye by shillinges (if the number of shillinges bee euen) which is thus: you shall take ½ ỹ nũber of the same shillings, and conuert them into peces of 2 shillinges. Then by the number of this halfe, you must first multiplye the last figure (towarde your right hand) of the number which is to be multiplied: And if there be anye tennes in the same product, those must you reserue in your minde: But if (with the same, or els without the same) you doo finde any diget number ỹ same diget nũber shall you double, & put it in the place of shillinges. Then must you procede to ỹ multiplicatiõ of ỹ other figures, addinge vnto ỹ product, the tennes whiche you before reserued: & there of shall come poundes.

Now for your better vnderstanding of this which hath bene said, and by ỹ way of example: I will propone vnto you this question.

At 8 shillings the grosse, what are 97 grosse worth after the rate?

First

First in this example I take halfe the nūber of shilligs, as before is taught that is to say of 8 shillinges whiche is 4 shillinges: this 4 shillings I put apart behinde a croked line, righte against 97 towardes the left hande, as here you may see, and as hereafter appeareth by diuers examples.

At 8 shil. the grosse.

4) VVhat will 9|7 grosse coste?

38 lib. 16 shil.

At 6 shil. the yarde.

3) VVhat 9|9?

29 lib. 14 shil.

At 12 shil.

6) VVhat 34|5?

207 lib. 0 shil.

At 14 shil.

7) VVhat 21|0?

147 lib. 0 shil.

Nowe

Now in ẏ first example, where it is demaunded at 8 s̈. the grosse, what are 97 grosse? First the ½ of 8 s̈. which is 4 s̈. beinge set apart behinde the croked line, as before is said: then I multiply the 97 by 4, saying first, 4 times 7, is 28. I double the diget number 8, and that maketh 16, the which 16, I do put vnder the line, in the place of shillings, and I keepe the 2 tennes in my minde, whiche here in worke doe represent 2 li. Then secondlye I multiplye 9 by the saide 4, and thereof cōmeth 36 where vnto I adde the 2 li. whiche before I did reserue, and they make 38. Therefore I put 38, vnder the line in the place of poundes, and the whole summe will be 38 li. 16 s̈. Thus much are the 97 grosse worth, at 8 shillinges the grosse: the lyke is to be done of all other. As of 12 s̈. in multiplyinge by 6. Likewise of 6 s̈. if you multiply by 3: also of 14, if you multiply by 7. And so of al euen numbers after the same maner.

For 1 shillinge you must take the ½ of

of the $\frac{1}{10}$ parte of any nūbre that is to be multiplyed.

And if anye thinge doe remaine, they are shil. Thus by	At 1 shil. What 350 / 17 li 10 shil.

this manner shil. are conuerted into pounds: for it is euen like as though you did diuide thē by 20 s. as by this example in the margēt doth appeare. Where it is demaunded at 1 s. ye yarde the peece or any other thing, what are 350 yardes or peeces worth.

First I seperate ye last figure of 350 next to my right hande, which is the 0, with a line betweene it and the fygure 5. Then I make a line vnder the 35|0, and I take ye $\frac{1}{2}$ of 35, after this maner: sayinge the $\frac{1}{2}$ of 3 is 1, & 1 remaynethe, whiche remayne signifyeth 10, in that seconde place. Then I put 1 vnder the line against 3, and I procede to the rest, saying the halfe of 15, is 7, (the whiche 15 came of the 1 that remayned, & of the 5 in ye firste place.) I put 7 vnder the line, right agaynste

5, and they make 17 li. The 1 whiche did last remayne, is 10 s̄. Now I put 10 s̄. aparte vnder the line; and the whole summe is 17 li. 10 s̄. so muche are 350 worth at 1 s̄. the peece.

But when the number of shillings is not some aliquot parte of 20 s̄. you must then conuerte the same number of shillinges, into the aliquot partes of 20, & make twoo or three products: as neede shall require, the which must bee added together after this maner folowinge.

For 3 shillinges, you must first take for 2 s̄. the $\frac{1}{10}$ of the number that is to be multiplyed, then for 1 shillinge, you must take the $\frac{1}{2}$ of the producte whiche did come of the same $\frac{1}{10}$ parte and adde these twoo summes together, as appeareth by this example folowinge.

At 3 s̄. the peece of any thing, what shall 684 peeces cost me after ẏ rate? First, for 2 shillinges I take the $\frac{1}{10}$ of

684, whiche is 68, in seperating the last figure 4, whiche I must double, and they bee 8: I set 8 s. aparte from the place of poundes, and then I have 68 poũdes 8 s. for ÿ $\frac{1}{10}$ parte, that is to say, for the 2 s. secondly, for 1 s. I take the $\frac{1}{2}$ of the product, that is to say: of 68 li. 8 s. which is 34 li. 4 s. and I put the same under the, 68 li. 8 shil. Then finally, I adde those two summes togither, that is to say 68 li. 8 s. and 34 li. 4 shil. so they make 102 li. 12 s, and so much are ÿ 684 peces worth at 3 shil. the peece, as maye appeare in the margent.

At 3 shil.
What 68|4?
68 li. 8 shi.
34 li. 4 shi.
102 li. 12 shi.

For 6 shil. take $\frac{3}{10}$ of the number whiche is to be multiplied: ÿ is to say, take first $\frac{1}{10}$, then double the producte of the same $\frac{1}{10}$. and add them togither Or otherwise for 4 s. take first the $\frac{1}{5}$ of the number that is to be multiplied, then for 2 s. take $\frac{1}{2}$ of the product, and

adde

adde them togither.

Or els take for 5 shil. the $\frac{1}{4}$ of the whole summe, then for 1 shil. take the $\frac{1}{5}$ of the product, and adde them togither.

Likewise for 7 shil. take first for 5 shi. the $\frac{1}{4}$, then for 2 shil. take the $\frac{1}{10}$ of the number which is to be multiplied, and adde them togither.

For 8 shillinges take the $\frac{2}{5}$ at two sundry times, that is to say, first $\frac{1}{5}$ for 4 shil. and then as much more for other 4 shil. and adde them togither.

For 9 shil. take first the $\frac{1}{4}$ and likewise the $\frac{1}{5}$ of the number that is to be multiplyed, and adde them togither.

For 11 shil. take first the $\frac{1}{2}$ for 10 s. Then for 1 shil. take the $\frac{1}{10}$ of the product, and add them togither, or els for 5 s. take the $\frac{1}{4}$: then for 4 s. take the $\frac{1}{5}$, & lastly for 2 s. take the $\frac{1}{2}$ of the last product and adde them togither.

For 12 shil. take first the $\frac{1}{2}$ for 10 shil. the tfor 2 s. ake the $\frac{1}{5}$ parte of the product, and adde them togither.

For 13 s. take the $\frac{1}{4}$ then the $\frac{1}{5}$, and a-

gayne another $\frac{1}{5}$ of the number which is to be multipied, and adde the products togither, that is to say: first for 5 shil. take the $\frac{1}{4}$: then for 4 shil. take the $\frac{1}{5}$. And agayne another $\frac{1}{5}$ for the other 4 s. & adde the three productes together, the like is to bee done in all others, when the price of the thing which is valued, is onely of shillings, as by these examples folowinge doth plainly appeare.

At 6 shillinges.

What 67?

13 *lib.*	8 *shil.*
6	14
20 *lib.*	2 *shil.*

At 7 shil.

What 347?

86	15
34	14
121 *lib.*	9 *shil.*

At

At 8 shil.
What 540?

108 lib.	0 shil.
108	0
216 lib.	0 shil.

At 9 shil.
What 230?

57	10
46	00
103 lib.	10 shil.

At 11 shil.
What 159?

79	10
7	19
87 lib.	9 shil.

At 12 shil.
What 349?

174	10
34	18
209 lib.	8 shil.

At 13 shil.
What 267?

66.	15.
53.	8.
53.	8.
173 lib.	11 shil.

Rule 5. Likewise in multiplying by pence, you shall haue (at y^e first instant) poũdes in the product, in case you knowe the aliquot parts of the $\frac{1}{10}$ of a pound, or of 24 pence, which are these 12, 8, 6 4, 3, and 2. For 12, is the $\frac{1}{2}$ of 24: 8 is the $\frac{1}{3}$: 6 is the $\frac{1}{4}$: 4 is the $\frac{1}{6}$: 3 is the $\frac{1}{8}$: and 2 the $\frac{1}{12}$: but for 12 d. whiche is 1 shil. I haue before made mention thereof.

For 8 d. you must take the $\frac{1}{3}$ of the $\frac{1}{10}$ and the rest which are the peces of 8 d. must be doubled to make of them peces of 4 d. And of the same number beinge doubled, you muste take the $\frac{1}{3}$ which will be shillinges, & if there doe yet remayn any thing, they are thirds of a shillinge, beinge in value 4 pence the peece.

For

For 6 d. take the $\frac{1}{4}$ of the $\frac{1}{10}$, and of that remayneth you muste take the $\frac{1}{2}$ which shall be shillinges: if there doe yet remaine 1, it shall bee in value 6 pence.

For 4 d, you must take the $\frac{1}{6}$ of the $\frac{1}{10}$ and of that which resteth take the $\frac{1}{3}$ to make thereof shillings: if any thing doe yet remaine, they are thirdes of a shillinge, beynge in value 4 pence the peece,

For 3 pence take the $\frac{1}{8}$ of the $\frac{1}{10}$, and of that remaineth, take the $\frac{1}{4}$ to make of them shillinges: if anye thinge doe yet remaine, they are fourthes of a shillinge, euerye one of them beynge worth 3 d.

For 2 d. take the $\frac{1}{12}$ of the $\frac{1}{10}$ and of that which resteth, take the $\frac{1}{6}$, ỳ whiche are shillinges, if there do still remaine any thinge, they shall be sixt parts of a shil, euery one beyng in value 2 d.

For 1 d. you shall understãde ỳ it is not possible with ease to bringe of d. poundes (into the product) upon the total summe: But first you must bring

them into shillinges, by the order of ẏ seconde rule of this chapter, and then afterward you shal conuert them into pounds, if nede so require, as by these examples folowing may appeare.

At 8 Pence.

VVhat 59|6?

19 lib. 17 shil. 4 d.

At 6 d.

What 67|8?

16 lib. 19 shil.

At 4 d.

What 93|4?

15 lib. 11 shil. 4 d.

At 3 d.

What 57|1?

7 lib. 2 shil. 9 d.

At 2 d.

What 36|4?

3 lib. 0 shil, 8 d.

At 1 d.

What 67|6?

5 lib. 12 shil. 8 d.
2 lib. 16 shil. 4 d.

But if the number of pence, be not an aliquot parte of 24 pence: Then must you bringe them into the aliquot partes of 24, and make thereof diuers productes, whiche must bee added together, as shall hereafter appeare.

For 5 pence, you shall first take for 3 pence, then for 2 pence, and adde thẽ together, accordinge to the instruction of the laste rule. Or else first, take for 4 pence, and then for 1 d.

For 7 d. first take for 4 d, then for 3 pence, and adde them together.

For 9 d. first take for 6 d, then for 3 pence, addinge them together.

For 10 d. first take for 6 d. then for 4 pence, and adde them together.

For 11 d. take first for 8 d. then for 3 d. and adde them together: as by these examples folowinge dothe appeare.

At 5 d.
What 92|7?

11.	11.	9.
7.	14.	6.
19 lib.	6 shi.	3 d.

At 7 d.
What 51|2?

8.	10.	8.
6.	8.	0.
14 li.	18 shi.	8 d.

At 9 d.
What 54|6?

13.	13.	0.
6.	16.	6.
20 lib.	9 shi.	6 d.

At 10 d.
What 27|3?

6.	16.	6.
4.	11.	0.
11 lib.	7 shi.	6 d.

At 11 d.
What 26 | 4?

8.	16.	0.
3.	6.	0.
12 lib.	2 shil.	0 d.

If you will multiply any number by shillinges, and pence beinge both togither, you muste take first for ye shil. according to the instructiō of the third rule of this first chapter, then take for the pence after the order of the 5 rule before mencioned: but if there be anye aliquot partes of 1 li. containing both shillinges and pence, then for those partes you shall take suche like parte of the number that is to be multiplied as the nūber is part of 1 li. the which aliquot partes are these, 6 s. 8 d: 3 s. 4 d: 2 s. 6 d: and 1 s. 8 d. For 6 s. 8 d. is the $\frac{1}{3}$ of a li: 3 s. 4 d. is the $\frac{1}{6}$ of a li: 2 s. 6 d. is the $\frac{1}{8}$: and 1 s. 8 d. is the $\frac{1}{12}$ of a li. or of 20 s. And therefore for 6 s. 8 d. you muste take the $\frac{1}{3}$ of the nūber that is to bee multiplied: and if anye thinge doe remaine, they are thirdes Rule. 6.

of a

of a li. euerye one beinge worth 6 s. 8 pence.

For 3 s. 4 d. you must take the $\frac{1}{6}$ of ye number whiche is to be multiplied, and if any thinge do remaine, they are sixth parts of a li. euery one beinge in value 3 s. 4 d.

For 2 s. 6 d. you must take the $\frac{1}{8}$: if anye thinge bee remaininge they are eyghth partes of li. yche one beynge worth 2 s. 6 pence.

Fo. 1 shillinge 8 d. you shall take the $\frac{1}{12}$ of the number that is to be multiplied, and if there do anye thinge remaine, they are twelfth partes of a pounde, euery one beinge in value 1 s 8 pence.

At 6 shil. 8 d.

VVhat 647?

215 lib. 13 shil. 4 d.

At 3 shil. 4 d.

VVhat 220?

36 lib. 13 shil. 4 d.

At

At 2 *shil.* 6 *d.*

VVhat 47?

5 *lib.* 17 *shil.* 6 *d.*

At 1 *shil.* 8 *d.*

VVhat 400?

33 *lib.* 6 *shil.* 8 *d.*

Here shall you accustome your selfe to multiply by all sortes of summes, beyng composed of shillings, & pence, which may come in vse or practise. As thus, for 1 s. 1 d: for 1 s. 2 d: 1 s. 3 d: for 1 s. 4 d: Likewise for 2 s. 1 d: 2 s. 2 d: 2 s. 3 d: 2 s. 4 d. And so of al other, consideringe moreouer, manye subtile abbreuiations, which happen oftentimes, that are easye to be conceaued. As thus at 11 s. 3 d. after that I haue taken first the $\frac{1}{2}$ for 10 s. Then for 1 s. 3 d. I take the $\frac{1}{8}$ of the product, bicause 1 s. 3 d. is the $\frac{1}{8}$ of 10 s. in takinge the saide $\frac{1}{8}$ of the producte. And by this meane, when ye haue taken one product, ye may often times vpō ẏ same, take another more brieflye than vpon the *Rule.* 7.

the summe that is to bee multiplyed, which thing you must fore see.

At 11 shil. 3 d.
VVhat 53?

26.	10.	0.
3.	6.	3.
29 *lib.*	16 *shil.*	3 *d.*

At 6 shil. 3 d.
VVhat 58?

14.	10.	0.
3.	12.	6.
18 *lib.*	2 *shil.*	6 *d.*

At 12 shil. 8 d.
What 64?

32.	0.	0.
6.	8.	0.
2.	2.	8.
40 *lib.*	10 *shil.*	8 *d.*

But if you will multiply by pounds shillings and pence, being altogither. Firste you must wholy multiply by poundes,

poundes. Then take for the shillings and pence, as in the 6 rule of this chapter is plainely declared. And as by examples following may appeare.

At 3 lib. 6 shil. 8 d.		
What 49?		
147.	0.	0.
16.	6.	8.
163 *lib.*	6 *shil.*	8 *d.*

At 5 lib. 18 shil. 4 d.		
What 543?		
2715.	0.	0.
271.	10.	0.
135.	15.	0.
90.	10.	0.
3212 *lib.*	15 *shi.*	0 *d*

At 2 lib. 7 shil. 4 d.		
What 927?		
1854.	0.	0.
185.	8.	0.
154.	10.	0.
2193 *li.*	18 *shi.*	0

8. 6d

Rule 9. So these rules do serue both to buy and sell. As at such a price the elle, the yarde, the pece, the pound waight, or any other thinge: how much is suche a thing, or so many elles worth? Likewise they are very necessary to couert all peces of gould and siluer into pou͂sudes: for I may as well say, at 4 shil. 8 d. the French crowne, what are 135 crownes worth, as to say at 4 s. 8 d. ye yarde of clothe, what are 135 yardes worth.

Rule 10. When any one of the summes which is to be multiplied, is composed of many denominations: and the other beinge of one figure alone: then shall ye multiply all the denominations of the other summe, by the same one figure, beginning first with that su͂me which is least in value towardes your righte hande, and bringe the product of those pence into shillinges, and the product of the shillinges into poundes, as by this example doth appeare.

At 3 li. 9 shil. 8 d. the peece.
What 7?

24 lib. 7 shil. 8 d.

But (if in any of the numbers which are to be multiplied) there be with it a broken nūber, you must (accordinge to his denominator) take one or many parts of the other number, as nede doth require: & set the number which commeth thereof vnder the productes addinge the same togither. As thus: At 5 li. 7 s̄. 8 d. the grosse, what shall 34 grosse ½ coste? Firste you shal multiply 5 li. 7 s̄ 8 d. by 34 grosse saying 5 tymes 34 do make 170 li. then for 6 s̄. 8 d. take the ⅓ of 34, which is 11 li 6 s̄. 8 d. Thirdely for 1 s̄. take 34 shil. whiche is 1 li. 14 s̄. Rule 11.

At	5 li.	7 shi.	8 d.
What	34 ½?		
	170 lib.	0 shi.	0
	11	6	8
	1	14	0
	2	13	10
	185 li.	18 shi.	6 d.

Finally for the ½ grosse, you must take ½ of ẏ 5 li. 7 s̄. 8 d̄. which is 2 li. 13 s̄. 10 d. And then adde your foure productes togither, so you shal finde, that the 34 grosse ½ at 5 pound 7 shilinges 8 pence

8 pence the grosse is worth 185 li. 14 s. 6 d. as appeareth in the example aforesayde.

And as in this last example, you did for the ½ grosse, take halfe of the price, (that one grosse was worth) And therefore bicause 1 grosse is worth 5 poūds 7 shillinges 8 pence: the ½ grosse must be worth halfe so much. So likewise if you haue ⅓ of a grosse, or of anye other thinge, you must take the ⅓ of the price, that one grosse is worth. And in like manner for the ¼ of any thing you shall take the ¼ of the price, also if you haue ⅔, take the ⅔ of the price that one is worth, and so of all other fractions, as by these examples folowing doth appeare.

At 4 lib. 6 shil. 8 d.
What 46 ½?

184.	0.	0.
15.	6.	8.
2.	3.	4.
201 *li.*	10 *shil.*	0 *d.*

At 8 lib. 0 shil. 9 d.
What $54\frac{1}{3}$?

432	0	0
1	7	0
0	13	6
2	13	7

436 lib. 14 shil. 1 d.

At 3 lib. 16 shil. 8 d.
What $17\frac{3}{4}$?

51	0	0
8	10	0
5	13	4
1	18	4
0	19	2

68 lib. 00 shi. 10 d.

12 If you wil make ye proofe of these rules aforesayde, you must first abate the summe of money (which the fraction of the multiplication dothe importe) from the totall summe. And diuide the rest of the poundes of ye sayde totall summe, by the whole multiplicand, the fraction onely accepted. And

yf any thinge doe remayne after the diuision is made, that remayne shall be multiplyed by 20: and vnto ye pro- duct of that multiplication, you shall adde the shillinges whiche remayned of the rest of the total summe. Againe, yf any thinge doo remayne after the same diuison, you muste multiplye the same by 12, and vnto the product add the pence of the totall summe that re- mained, if any be left. And thus if ye ye haue truly wrought, you shall find agayne ye higher summe of your que- stion that is to saye, the price that one grosse or anye other thinge is worth, whereof the question is demaunded.

Or otherwise reduce the remaine of the totall summe (the value of the money that the fraction is worthe beinge firste deducted) all into pence, in multiplyinge the poundes by 20; and the shillinges by 12: adding there vnto, the shillinges and pence, which are ioyned with the remaine of ye said totall summe, if any such be, then di- uide those pence by the foresaide num-

ber

ber that is to be multiplied, ẏ fractiōs of the same number being also abated So shall you finde the price that one peece, one grosse, or any other thinge is valued at. As in the first of ẏ 3 last examples goyng, before where the totall sūme is 201 pounds 10 shillings: from ẏ which I doe abate the price of ẏ halfe grosse whiche is 2 li. 3 s̄. 4 d. ẏ reste is 199 li. 6 s̄. 8 d: which beinge reduced into pēce bringeth 47840 s̄. I diuide the same by 46, and therof commeth 1040 pence. Then I diuide that 1040 pence, by 12: and they bringe 86 shillinges 8 d, that is to say 4 li. 6 shillinges 8 pence, whiche is the price that one grosse, or anye other thinge did cost, as in that first example doth appeare.

The lyke is to be doone of any manner of thinge that is solde by the hundred, after 5 score to the hundreth. *Rule 13.*

As thus: at 12 pound, 7 shillings 6 d. the 100 poundes waighte, what shall 374 poundes waighte cost? You shall first multiply 12 pounds 7 shillings 6

pence, by 3: that is to say, by thre hundreth. Thē for 50 li. waight you shall take the $\frac{1}{2}$ of 12 li. 7 s. 6 d. bicause 50 li. is the $\frac{1}{2}$ of 100 li. Likewise for 20 li. waight, which is the $\frac{1}{5}$ of 100 li. you shall take the $\frac{1}{5}$ of 12 li. 7 s. 6 d. lastly for 4 l. waight you must take the $\frac{1}{5}$ of the last product This donne, you muste adde all these products into one summe, which will make the summe of 46 li. 5 s. 7 d. $\frac{4}{5}$: as by this example aboue writtē doth appeare.

At 12 lib.	*7 shil.*	*6 d.*	
What 3|74?			
37.	2.	6.	
6.	3.	9.	
2.	9.	6.	
0.	9.	10. $\frac{4}{5}$.	
46 *li.*	5 *sh.*	7 *d.* $\frac{4}{5}$	

The proofe is made by reducinge ye totall summe into pence. And to diuide the product by the number that is to be multiplyed, that is to saye by 374, likewise diuide the quotient produced of that first diuision by 12: so shall you finde agayne the higher summe 12 li, 7 s, 6 d, whiche is the

price

price of 100 li. waight, as before.

Also the like may bee doone of our usuall waight here in Englande, (whiche is 112 li. for every hundred pounde waight) in case you knowe ye aliquot partes of a hundred, that is to say, of 112 li. waight, which are these 56 li: 28 li: 14 li: & 7 li. For 56 li. is ye $\frac{1}{2}$ of 112: 28 li: is the $\frac{1}{4}$ of 112 li: 14 li, is the $\frac{1}{8}$ and 7 li: is the $\frac{1}{16}$.

Therefore, for 56 li: take the $\frac{1}{2}$ of ye summe of money, that the 112 pound waight is worthe.

For 28 li. take the $\frac{1}{4}$ of the summe of money that the 112 li. is worth.

For 14 li. take the $\frac{1}{8}$ of the summe that the C. is worthe.

For 7 li. take the $\frac{1}{16}$ of the summe of money that the C. is worth.

As thus, at 3 li, 6 s, 8 d. the hundreth poundes waight, that is to say, ye 112 li. what shall 24 hūdreth 3 quarters, 21 li. waight, cost after the rate?

First, you shal multiply 24 hūdreth by 3, whiche is the 3 li: & thereof will come 72 li, then for 6 s. 8 d. whiche is

the $\frac{1}{3}$ of 20 s̃, you shall take the $\frac{1}{3}$ of 24, whiche is 8 li: for 24 Nobles, maketh 8 li. afterwarde, for the 3 quarters of ye C. you shall first for ye 56 li. take ye $\frac{1}{2}$ of 3 li. 6 s̃. 8 d. bicause 56 li. is ye $\frac{1}{2}$ of the C. and

At 3 li. 6 sh 8 d.		
What 24 C. 3 qu. 21 li.		
72.	0.	0.
8.	0.	0.
1.	13.	4.
	16.	8.
	8.	4.
	4.	2.
83 li.	2 sh.	6 d.

therof commeth 1 li. 13 shil. 4 d. then for 28 li. (which is ye quarter of a C.) you shall take the $\frac{1}{4}$ of 3 li. 6 s̃. 8 d. or els the $\frac{1}{2}$ of the product, which cometh last of 56 li. which is 16 s̃. 8 d. likwise for 14 li you must take the $\frac{1}{8}$ of 3 li. 6 s̃. 8 d. which is 8 s̃. 4 d. or els the $\frac{1}{2}$ of ye product that cōmeth of 28 li. which is all one. Finally for 7 li. take the $\frac{1}{16}$ of 3 li 6 s̃. 8 d. or els ye $\frac{1}{2}$ of ye last product that cōmeth of 14 li. & therof cōmeth 4 s̃. 2 d. Then add all these products togither: and the totall summe wilbe 83 li. 2 s̃. 6 d. so much are ye 24

C. 3

C. 3 quarters, & 21 li. waight worthe after 3 li. 6 s. 8 d. the hundreth, as appeareth in the margent.

The proofe hereof is made, lyke to the other proofes afore saide, sauinge that where in those profes, you abate the price of the money, that the fractition was worth, from the totall sum. Here in this example (and in such other like) you must abate the price of ye money, that the odde waight amounteth vnto (ouer and aboue the iuste hundrethes) from the said totall sum: the rest thereof shall you conuert into pence, diuidinge the product of ye multiplication by the iuste number of the number of the hundrethes, so shal you finde the pence, that one hundreth is worthe: whiche you shall bringe into poundes by the order of diuision, and so of all other.

The seconde chapter treateth of the *rule of three composed, the which is distinct into foure Rules, each of them differinge, the one from the other.*

There belongeth to the first and seconde partes of the rule of three composed alwaies 5 numbers: wherof (in the first part of the rule of three composed) the seconde number and ye fifte, are alwaies of one semblaunce and like denomination: whose rule is

Rule 1. thus. You must multiply ye first number by the second and that shalbe your diuisor: then multiply the other three numbers the one by the other to bee your diuidende.

Example of this first part, yf 100 crownes, in 12 monethes, doe gaine 15 li. what will 60 crownes gaine in 8 monethes? *Answere*, first multiply 100 crownes by 12 monethes: and therof commeth, 1200 for your diuisor then multiply 15 li. by 60 crownes, & by 8 monethes, and you shall haue 7200 wherfore diuide 7200 by 1200 and thereof commeth 6 li. so many li. will 60 crownes gaine in 8 monethes this questiõ may be done by ye double rule of 3, that is to say by the rule of 3 at 2 times. But yet this rule of 3 com

posed

posed is more breife.

Crownes. monthes. poūds. crownes monthes

100. 12. 15. 60. 8.

~~1~~
~~7~~ ~~2~~|00
~~1~~ ~~2~~|00 (6 li.

2 In the seconde part of the rule of three composed the thirde number is like vnto the fift, whereof the rule is thus you must multiply the third nū- ber by the the fourthe, and the product shalbe your diuisor, then multiply the first number by the seconde, and ẏͤ pro duct therof by the fift, the which num- ber shalbe your diuidend, or number ẏͭ is to be diuided: as by example. *Rule. 2.*

When 60 crownes in 8 monthes do gaine 6 li. in how many monthes wil 100 crownes gaine 15 li. *Answere*, Multiplye the third number 6, by the fourth number 100: and thereof com- meth 600: whiche shalbe youre diui- sor, then multiply the first number 60 by the seconde number 8 and the pro-

ducte

duct thereof by the fift number 15 and thereof will come 7200: then diuide 7200, by 600, and the quotient will be 12 in so many, monthes will 100 crownes gaine 15 li. This question may likewise be done by the rule of 3 at 2 times.

Crownes.	monthes.	poũds.	crownes.	poũds.
60.	8.	6.	100.	15.

$$\frac{\cancel{7}\cancel{2}\,|\,00\ \text{monthes.}}{\cancel{6}\cancel{0}\,|\,00}\ (12$$

Rule 3. In the thirde parte of the rule of 3. composed, there may be 5 numbers, or more: and in this rule, ẏ first number and the last are alwaies dessemblaunt and of vnlike denomination, the one to the other: and the question is from the last number vnto the first, whereof the rule is thus, you must multiplye that number which you would know by those numbers which doe giue the value, & diuide the product of the same by the multiplication of the numbers

which are all readye valued, as by example. If 4 deniers Parisis be worth 5 deniers Tournois, and 10 deniers tournois, be worth 12 deniers of savoy, I demaunde how many deniers Parisis are 8 deniers of savoy worth *Answere*: Multiply 8 deniers of savoy (whiche is the number that you would know) by 4 deniers parisis, & by 10 deniers tournois which are the numbers ẏ giue ẏ value & they make 320: thē multiply 5 den. tournois, by 12 deniers of savoy (whiche are the numbers already valued & they make 60: Finally diuide 320 by 60 and you shal finde 5 deniers $\frac{1}{3}$ parisis, so much are the 8 deniers of Savoy worth.

Parisis. tournois. tournois. savoy. savoy.
4 *d.* 5 *d.* 10 *d.* 12 *d.* 8 *d.*

$$\frac{\cancel{3}2|0}{\cancel{6}|0}\ \textit{par.}\ (5\,d.\tfrac{1}{3}.$$

In the fourth part of the rule of thre composed: the fyrst number and the last *Rule.* 4.

last are alwayes semblante and of one denomination, and the questiõ of this rule, is alwaies from the last number to the last sauinge one. whereof there is a rule which is thus. You must multiply that number which you woulde know, by the numbers that are already valued, and diuide the product of ỹ same, by the multiplycation which cõmeth of the numbers that giue the valne, as by example.

Rule 4.

If 4 deniers Parisis, be worth 5 Deniers Tournois, and 10 deniers tournois, be worth 12 Deniers of Sauoy: I demaunde how manye Deniers of Sauoy, are 15 deniers Parisis worth? *Answere*, Multiplye 15 Deniers Parisis that you would know, by 5 deniers Tournois, and by 12 Deniers of Sauoy, which are the numbers already valued, & they make 900. Diuide the same by 4 times 10 which are the numbers that doe giue the value that is to say by 40, and you shall finde 22 Deniers $\frac{1}{2}$ of Sauoy: so much are the 15 Deniers Parisis worth.

Parisis

Parisis.	tournois.	tournois.	Sauoy.	Parisis.
4 d.	5 d.	10 d.	12 d.	15 d.

~~1~~ 2
~~9~~ ~~0~~ | 0 Sauoy.
~~4~~ ~~4~~ | 0 (22 d. $\frac{1}{2}$.

The thirde Chapter treateth of questions of the trade of Marchandise: in the whiche is taught the rule of three in Fractions, beginning at the fifthe question followinge.

If 31 Deuonsh. dosens, doo cost me 100 li. 15 shil. what shall 4 dosens cost after the same rate. *Answere*: first bringe the 100 li. 15 shil. al into shillinges, in multiplyinge the 100 li. by 20, and addinge to the product the 15 shill. and thereof commeth 2015 shil. then multiply 2015 by the thirde nūber 4, and diuide the product by 31, & ye quotient will be 260 s. The whiche diuide againe by 20, and thereof commeth 13 li. And so muche are the 4 dosens worth.

Dosens.	lib.	shil.	Dosens.
31.	100.	15.	4

20

2015

4

8060.

1
28
8060 (260.
3111
33

2. If 4 dosens bee worthe 13 li. what are 31 Dosens worthe by the pryce? *Answere*: Multiply 31 by 13, & thereof commeth 403. The whiche you shall diuide by 4, and thereof commeth 100 li. $\frac{3}{4}$. whiche $\frac{3}{4}$ are 15 s. and so muche are 31 Dosens worthe, as before.

Dosens.	lib.	Dosens.
4	13	31

13

93
31

403.

403
444 (100 li. $\frac{3}{4}$.

3. If 49 ells be worth 2 li. 4 s̄ 11 d. what are elles worthe by the price? First you must bringe 2 li. 4 s̄ 11 d al into pence, in multiplyinge 2 li, by 20 maketh 40: adde thereto 4 shillinges they make 44 s̄: the which multiplye by 12 d. and they make 528 d. where unto adde 11 d. all is 539 d. the which 539 d. must be youre seconde number in the rule of three then multiply 539 by ye thirde 18, number & thereof commeth 9702. divide ye same by 49, & you shall have in your quotient 198 d. the which divide by 12, and you shall find 16 s̄. 5 pence: so much are the 18 elles worth.

Ells.	lib.	shil.	d.	Ells.
49	2	4	11	18
	20			539
	44			18
	12			4312
	88			539
	441			
	1			
	539.			9702

1 3		1	
4 2 7		7 6	
8 8 6		1 9 8	(16 shil. 6 d.
9 7 0 2	(198.	1 2 2	
4 9 9 9		1	
4 4			

4. If 18 ells be worth 16 s. 6 pence, what are 49 elles worth by the price? *Answere*, bringe 16 shi. 6 d. into pence in multiplyinge 16, by 12: and thereof commeth 198 d. with the 6 d. added to it, then multiply 198 by 49 the product will be 9702. The which diuide by 18 elles and therof commeth 539 d. Then diuids 539 d. then diuide 539 by 12, and ẏ product therof by 20. So shall you haue 2 li. 4 shil. 11 d. and so muche are the 49 ells worth.

Ells.	*shil.*	*d.*	*Ells.*
18	16	6	49
	12		198
	32		392
	166		441
	198		49
			9702

1 3

```
 17          1
 448        181
 8702 (539.  830 (44 ſhil.
 1888       122
  11          1
```

Note that wheras in the firſt part of this booke, I haue ſet furth the rule of three both in whole numbers, and alſo in fractiõs: now I will ſhew you how to doe the ſaide rule of three, in fractiõs more at large. And therefore, for yͤ I wold haue you to vnderſtã yͤ ſame generaly, you muſt firſt conſider if the three numbers that ſhalbe proponed (in anye queſtion of the ſaide rule of three) be all fractions yea are no: which if they be all thre numbers fractions: then muſte you worke as foloweth.

Firſte you muſt multiply the numerators, of the ſeconde and third fractions in your rule of three, the one by the other, and againe you muſt multiply that product, by the denomina-

 tor of

tor of the first fraction: And the number which commeth of this laste multiplycation: shall be your diuidende, or number that must be diuided.

Secondly you must multiply likewaies ye denominators, of ye seconde & thirde fractions in your saide rule of thre: the one by ye other, & the of come, againe by the numerator of the firste fraction. And the nūber which is produced of that multiplication, shall bee your diuisor.

Thirdly you must diuide the a fore saide diuidende by the diuisor, and the quotient wilbe ye answere to the question, as by Examples shall heareafter appeare.

But if you finde whole numbers & fractions togither, in the saide rule of three: you must first reduce the same in their fractions, by the 6 reduction.

Likewaies if you finde any of the

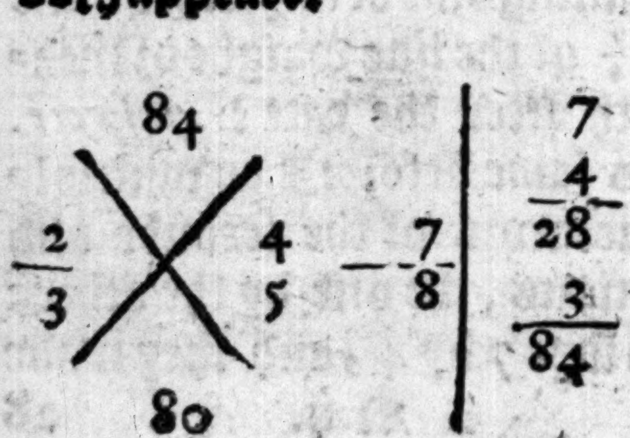
three

three numbers in your rule of thre: to be whole numbers, alone withoute any fraction ioyned with it, you must in this case put 1 vnder yͤ same whole number with a line betweene them both: The which 1 doth represent the denominator to the same whole number, & then you must procede, to worke the rule of three in like manner, as though they were al fractions: as before is saide.

The Examples of all three differen-
ces aforesaid do follow in the thre next questions orderly.

If $\frac{2}{3} \times \frac{4}{5}$ $\frac{7}{8}$: I do vnderstande thereby thus as followeth. Yf $\frac{2}{3}$ of any waight, or measure, be worth $\frac{4}{5}$ of twenty shillings, or of any other some what are $\frac{7}{8}$ of the like waight or measure worth after the rate: *Answere.* 5
First as is saide before: I do multiply the Numerators of the seconde and third fractions, the one by the other: that is to saye 7 by 4, and they make

28: againe, I doe multiply the said 28 by the denominator of the first fraction, that is to saye by 3 : and thereof commeth 84 : the which 84 I set ouer the crosse for my diuidend. Secondly, I doe multiplye the denominators of the second and third fractions the one by the other : Namely 8 by 5, and they make 40: Againe I do multiply ẏ said 40, by the numerator of the first fraction : that is to say by 2, and thereof commeth 80 the same 80, I do set vnder the crosse for my diuisor. Then I diuide 84 by 80, and ther commeth in the quotient 1 li. and $\frac{4}{80}$ remaining, ẏ which $\frac{4}{80}$ beinge abbreuied, maketh $\frac{1}{20}$ of a pounde, whiche is worthe 12 pence. And so much will the aforesaid $\frac{7}{8}$ coste, as by the worke folowinge doth appeare.



8	$\cancel{8}\cancel{4}$
5	$\cancel{8}\cancel{0}$ (1 $\frac{4}{10}$.
40	
2	
80	

6. If $\frac{2}{5}$ of an ell, of any marchandise do cost me 12 shil. 7 d. the which 7 d. doth make $\frac{7}{12}$: what will $\frac{9}{10}$ of an ell coste me after the saime rate? *Answere* First I set down my numbers as followeth. If $\frac{2}{5} \times 12\frac{7}{12}$. $\frac{9}{10}$. Then by the *6* reduction I reduce $12\frac{7}{12}$ all into twelfthes, and they make $\frac{151}{12}$ for the seconde nũber in my rule of three. which must stande in ye place of $12\frac{7}{12}$. And then will my 3 numbers stande thus as followeth $\frac{2}{5} \times \frac{151}{12}$. $\frac{9}{10}$. Then I multiply 151 by *9*, and the of come by 5, and therof commeth *6795*, the whiche I do set ouer the crosse for my diuidend. Likewise I multiply 12 by 10, and the of come by 2, and therof commeth 240: which I do set vnder the crosse for my diuisor. Then I diuide *6795*, by 240: and there commeth

in the quotient 28 shilinges: and 75 remaininge, the which 75 bicause it is the remaine of shi. I do multiply it by 12 penies, for that there is 12 penies in a shil. and thereof cōmeth 900. The same 900. I diuide againe by 240, & thereof cōmeth 3 penies, and 180 remaining which 180. I do sette aparte ouer 240, with a line betweene them both, and they are $\frac{180}{240}$. The which beinge abbreuied doe make $\frac{3}{4}$ of a penie. And thus I finde that the $\frac{9}{10}$ of an ell shal cost 28 s. 3 d. $\frac{3}{4}$ as hereafter doth appeare.

151	12		6795		
$12\frac{7}{12}$	12				
	24	$\frac{2}{5}$	X	$\frac{151.}{12.}$	$\frac{9}{10}$
	127				
	151				
			240		

151	12	13	
9	10	2 0 7	
1359	120	6795	(28 shil.
5	2	2400	
6795	240	24	

75	1
12	8
150	960 (3 d. $\frac{180}{240}$.
75	240
900	$\frac{3}{4}$.

7. If $\frac{3}{5}$ of an elle doe coste me 8 shillinges, what will 7 ells $\frac{1}{2}$ coste me after the rate? *Answere*: I doe first reduce the whole number and broken into his broken by the sixte reduction, that is to say, 7 $\frac{1}{2}$ into halfes, and they are $\frac{15}{2}$, which muste be the thirde number in my rule of thre, the second number is 8 shil. but I must (as before is taught) put 1 vnder 8 with a line betwene them, to make it like a fraction thus, $\frac{8}{1}$. Then muste my thre numbers in my rule of three, stande after this manner: $\frac{3}{5}$ $\times$ $\frac{8}{1}$. $\frac{15}{2}$. Then I doe multiply 15 by 8, & the product thereof by 5, amounteth 600: The which I do set ouer the crosse, for my diuidend. Likewise I doe multiplye 2 by 1, & the producte thereof by 3, and thereof commeth 6, the which I do sett vnder

the crosse for my diuisor. Then I diuide 600 by 6, and I finde in my quotient 100: the which is 100 shillings: I do therefore diuide 100 by 20 shil, & my quotient is 5 li. And so much will the 7elles $\frac{1}{2}$ cost me, as here after doth appeare

$7\frac{1}{2}$ | 7, 2, 14, 1, 15 | $\frac{3}{5}$ X $\frac{8}{1}$ (600 above, 6 below) $\frac{15}{2}$

15	2			
8	1	~~600~~	(100 sh.	~~10~~0
120	2	~~666~~		~~20~~ (5 li.
5	3			
600	6			

If 1 yarde of Veluet cost 19 shil. what shall $\frac{3}{4}$ of a yarde cost? *Answere:* sette downe youre numbers thus. If $\frac{1}{1} \times \frac{19}{1}$. $\frac{3}{4}$. Thē multiply 1 times 19, by 3: and thereof commeth 57 for

youre

your diuidende, or number to be diuided. The whiche 57 you shall diuide by 1 times 1, 4 times, whiche are 4, & your quotient will be 14 s̄. $\frac{1}{4}$, which $\frac{1}{4}$ is worthe 3 d. so muche are the $\frac{3}{4}$ of a yarde worthe after 19 shil. the yarde, as by practise foloweth.

$$\begin{array}{ccc} & 57 & \\ \frac{1}{1} & \times & \frac{19}{1} \\ & 4 & \end{array} \qquad \frac{3}{4} \left| \begin{array}{l} \cancel{1}\ 1 \\ \cancel{5}\cancel{7} \\ \cancel{4}\cancel{4} \end{array} \right. (14\ shi.\ \tfrac{1}{4}.$$

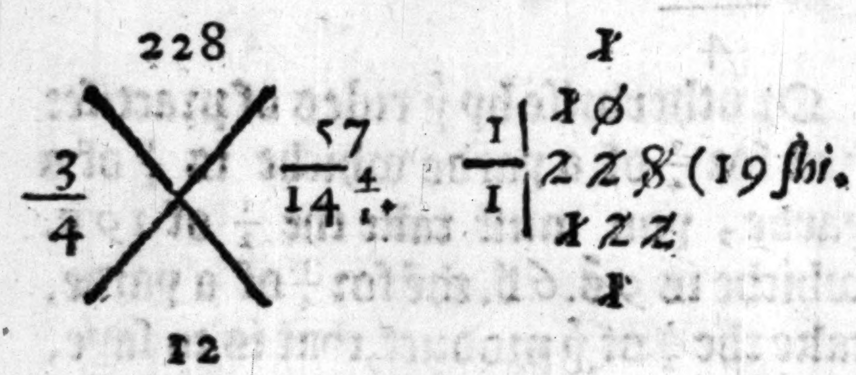
Or otherwise by ẏ rules of practise: first for $\frac{2}{4}$ of a yarde whiche is $\frac{1}{2}$ of a yarde, you must take the $\frac{1}{2}$ of 19 s̄. whiche is 9 s̄. 6 d. thē for $\frac{1}{4}$ of a yarde, take the $\frac{1}{2}$ of ẏ product, that is to saye, of 9 s̄. 6 d. and thereof commeth 4 s̄. 9 d. adde these numbers together, and you shall haue 14 s̄. 3 d. as aboue is sayde, and as appeareth heere in ẏ margent.

19 *shil.*	
9 *shil.*	6 *d.*
4.	9.
14.	3 d.

9. If $\frac{3}{4}$ of a yarde

Of

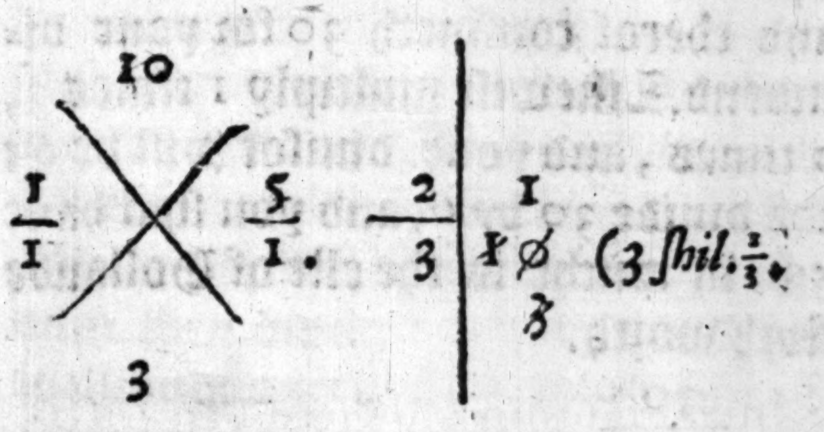
of Veluet doo cost 14 shil. 3 d. what shall 1 yarde coste? *Answere*: Set your nūbers down thus: if $\frac{3}{4}$ ╳ 14 $\frac{1}{4}$. $\frac{1}{1}$. Reduce 14 $\frac{1}{4}$ into a fraction, and they will be $\frac{57}{4}$, then multiply 57 by 1, 4 times, and thereof commeth 228 for your diuidende. Likewise multiply 1 times 4, 3 times, & thereof commeth 12 for your diuisor: then diuide 228 by 12, and your quotient will be 19 s. so much is the yarde of veluet worth.



Or otherwise by the rule of practise: you shall take the $\frac{1}{3}$ parte of 14 shil. 3 d. whiche is 4 s. 9 d. & adde it with ẏ same 14 shil. 3 d. and you shall haue 19 shil. as before.

14 shil.	3 d.
4	9 d.
19 shil.	0 d.

10. If one elle of Hollande cloth be worth 5 s̄, what are $\frac{2}{3}$ worth after the rate? *Answere*, say thus if $\frac{1}{1} \times \frac{5}{1}$. $\frac{2}{3}$ Then multiply 2 times 5, one time, & thereof cōmeth 10, for your diuidende likewise multiply 3 times 1, one time, they make 3, for your diuisor, then diuide 10 by 3 and therof commeth 3 s̄. $\frac{1}{3}$ which $\frac{1}{3}$ is worth 4 pence, & so much are the $\frac{2}{3}$ of an elle worth.



Or otherwise, by the rule of practise: take first the $\frac{1}{3}$ of 5 s̄. for ye $\frac{1}{3}$ of an elle and that is 1 s̄. 8 d̄. Likewise, for the other

other $\frac{1}{3}$ of an elle, take againe another $\frac{1}{3}$ of 5 s. which is also 1 shillinge 8 d. and adde them togither, and so shall you haue 3 s. 4 d. as before.

5 shil.	
1.	8.
1.	8.
3 shil.	4 d.

11 If $\frac{2}{3}$ of an elle of Hollande clothe doe coste me 3 s. 4 d. what shall 1 elle coste? *Answere*, set downe your numbers thus: if $\frac{2}{3} \times 3\frac{1}{3}.\ \frac{1}{1}$. First reduce $3\frac{1}{3}$ all into thirdes, and it wilbe $\frac{10}{3}$. Thē multiply 1 times 10, 3 times and therof commeth 30 for your diuidend. Likewise multiply 1 times 3, 2 times, and your diuisor will be 6: thē diuide 30 by 6, and you shal haue 5 s. so muche is the elle of Hollande cloth worth.

$$\begin{array}{cccc} & 30 & & \\ \frac{2}{3} & \frac{10}{3}\ \left(3\frac{1}{3}\right. & \frac{1}{1}. & \frac{\cancel{30}}{\cancel{6}}\ (5\ sh. \\ & 6 & & \end{array}$$

Or otherwise by practise, take the $\frac{1}{2}$ of 3 s. 2 d. whiche is 1 shillinge 8 pence. and adde it to the same 3 shillinges 4 d. and thereof will come 5 s. as before. For the $\frac{1}{3}$ of 5 s. is as muche as the $\frac{1}{2}$ of 3 s. 4 d. whiche was the price that the $\frac{2}{3}$ of an elle did cost, as appeareth.

3 *shil.*	4 *d.*
1.	8.
5 *shil.*	0 d.

12 If one elle cost me 17 s. what shal 15 elles $\frac{1}{8}$ parte cost? which $\frac{1}{8}$ is halfe a quarter of an elle. *Answere*, saye if $\frac{1}{1} \times \frac{17}{1}$. 15 $\frac{1}{8}$. First reduce 15 $\frac{1}{8}$ into eighte partes, & they make $\frac{121}{8}$ then multiply 121 by 17, 1 time, and thereof commeth 2057, for your diuidend. Likewise multiply 8 times 1, 1 time, and the product will be 8, for your diuisor, then diuide 2057, by 8, and you shall finde 257 shil: $\frac{1}{8}$, which is 12 li 17 s. 1 d. $\frac{1}{2}$ & so much are the 15 elles $\frac{1}{8}$ worth, as by practise dothe appeare in the page folowinge.

$\frac{1}{1}$ $\frac{17}{1}$ $\frac{121}{15\frac{1}{8}}$

Or otherwise, for 10 s. take the $\frac{1}{2}$ of 15, which is 7 li 10 s. then for 5 s take the $\frac{1}{2}$ of 7 li. 10 s. which is 3 li. 15 s. thirdly for 2 s. take the $\frac{1}{5}$ of 7 li. 10 s. bicause yͤ $\frac{1}{5}$ of 10 s is 2 s. Fourthly for yͤ $\frac{1}{8}$ of yͤ elle, you shall take the $\frac{1}{8}$ of 17 s. whiche is 2 shil. 1 d: $\frac{1}{2}$. Then adde all these sumes together, and you shall finde 12 li. 17 s, 1 d, $\frac{1}{2}$: as before, and as appeareth more playnly in the former practise.

15.	$\frac{1}{8}$.	
17.		
7.	10.	0.
3.	15.	0.
1.	10.	0.
	2.	1 $\frac{1}{2}$.
12 *li.*	17 *sh.*	1 *d.* $\frac{1}{2}$

13 If 25 elles be worth 2 li. 3 s. 4 d. what are 18 elles $\frac{3}{4}$ worth by yͤ price? *Answere*, firste put 3 s. 4 d. into the parte of a li. and you shall haue $\frac{1}{6}$: then say, if $\frac{25}{1}$ giue me 2 li. $\frac{1}{6}$ what shall 18 $\frac{3}{4}$ giue

$\frac{3}{4}$ giue? put the whole number 6 into their broken, and then multiplye 1 times 13 by 75, the producte will be 975, the which you shall diuide by 25 times 6, 4 times: which maketh 600. Then diuide 975 by 600: and youre quotient willbe 1 li. and 375 will remaine, the which 375 you shall multiply by 20, and therof will come 7500 diuide ẏ same by 600 your quotiẽt wil be 12 s. & 300 will remaine, the which abbreuied is $\frac{1}{2}$ which is 6 d. thus the 18 elles $\frac{3}{4}$ are worth 1 li. 12 s. 6 d. as by practise wil appeare.

$$\frac{25}{1} \times 2\tfrac{1}{6} \quad 13 \qquad\qquad 75 \quad 18\tfrac{3}{4}.$$

Or otherwise by the rules of practise, for bicause that 12 elles $\frac{1}{2}$ is the $\frac{1}{2}$ of 25 elles, therfore take the $\frac{1}{2}$ of 2 li. 3 s. 4 d. which is 1 li. 1 s. 8 d. thẽ for 6 elles $\frac{1}{4}$ take the $\frac{1}{4}$ of 2 li. 3 s. 4 d. or els the $\frac{1}{2}$ of the last product (that is to say of 1 li. 1 s. 8 d.) which is all one, & adde them togither, so shall you haue 1 li. 12 s. 6 d. as before

lib.	shil.	d.
2.	3.	4.
1.	1.	8.
	10.	10.
1 lib.	12 shil.	6 d.

14. If 15 yardes be worth 32 s. what are halfe a yarde and halfe a quarter, or els $\frac{5}{8}$ of a yarde worthe? *Answere*, saye if $\frac{15}{1}$ giue $\frac{32}{1}$ what will $\frac{5}{8}$ gyue? Multiply 1 times 32 by 5, and diuide the product by 15 times 8 times, and your quotient wilbe 1: and $\frac{40}{120}$ remay ning, which is $\frac{1}{3}$ of a shil. that is to say 4 d. and so muche are the $\frac{5}{8}$ of a yarde worth, that is to say 1 s. 4 d.

$$\frac{15}{1} \times \frac{32}{1} \qquad \frac{5}{8}.$$

Or otherwise, se what the yarde is worth after the maner aforesaid in the other examples, and you shall finde that the yarde is worthe 2 s. 1 d $\frac{3}{5}$: of the whiche number take first the $\frac{1}{2}$ for $\frac{4}{8}$, whiche is 1 s. 0 d, $\frac{4}{5}$, of the whiche number, take the $\frac{1}{4}$ for the other $\frac{1}{8}$,

whiche

whiche is 3 d. $\frac{2}{5}$, adde these two numbers togither, and you shal finde the $\frac{5}{6}$ to be worth 1 s. 4 d. as before is said.

2 shi.	1 d. $\frac{2}{5}$.	
1.	0. $\frac{4}{5}$.	
	3. $\frac{1}{5}$.	
1 shil.	4 d.	0.

15 If 13 elles $\frac{5}{6}$ be worthe 27 shil. what are 10 elles $\frac{2}{3}$ worth by ye price? *Answere*, saye if 13 $\frac{5}{6}$ giue $\frac{27}{1}$, what shall 10 $\frac{2}{3}$ giue? put the whole numbers into their broken, and you shall finde $\frac{83}{6}$, $\frac{27}{1}$, and $\frac{32}{3}$. Then multiplye 6 times 27, by 32, and thereof cometh 5184 the whiche number you shall diuide by 83 times 1, 3 times, & you shall finde 20 shil. $\frac{68}{83}$ which fraction is worth 8 d. $\frac{69}{83}$ parts of a peny.

$$\frac{83}{13\frac{5}{6}} \times \frac{27}{1} \quad \frac{32}{10\frac{2}{3}}$$

16 If 2 yardes $\frac{1}{2}$ be worthe 4 s. 8 d. what are 8 yardes $\frac{1}{4}$ worth? *Answere*

put the 8 d. into the part of a shillinge setting 8 over 12, & it wil be $\frac{8}{12}$, which abbreuied, are $\frac{2}{3}$, thē reduce the whole numbers into their broken, and they wil stande thus: $\frac{5}{2}$, $\frac{14}{3}$, $\frac{33}{4}$, thē multiply 2 times 14 by 33, and diuide the product by 5 times 3, 4 times: & you shall finde 15 s. and $\frac{24}{60}$ will remaine which are worthe 4 d. $\frac{4}{5}$, so muche are the 8 yardes $\frac{8}{4}$ worthe.

$\frac{5}{2\frac{1}{2}} \times \frac{14}{4\frac{2}{3}} \qquad \frac{33}{8\frac{1}{4}}$

17 If 1 kersey be worth 2 li. 6 s. 8 d. how many kerseys shall I buy for 36 li. 3 s. 4 d. after the rate? *Answere*, put 6 s. 8 d. into the parte of a li. and you shall haue 2 li. $\frac{1}{3}$, for the firste number in the rule of 3, and 1 kersey for the seconde number: then put 3 s. 4 d. into the part of a li. and it is $\frac{1}{6}$, so you shal haue 36 li. $\frac{1}{6}$ for the third number, thē will your 3 numbers in the rule of 3, stande thus. $2\frac{1}{3} \times \frac{1}{1}$. $36\frac{1}{6}$. Then reduce the whole numbers into their bro-

broke, & it wilbe thus, $\frac{7}{3} \times \frac{1}{1} \quad \frac{217}{6}$.
Then multiply 3 times 1 by 217 and therof will come 651 for your diuidende. Likewise multiplye 7 times 1, by 6: and the product thereof wilbe 42. Then diuide 651, by 42. and you shall finde $15\frac{1}{2}$. So many kersees of 2 li. 6 s. 8 d. the peece, shall you haue for 36 li. 3 s. 4 d.

$$\frac{7}{2\frac{1}{3}} \times \frac{1}{1} \qquad \frac{217}{36\frac{1}{6}}.$$

The 4 Chapter treateth of losses and *gaynes, in the trade of Marchaundise.*

1. If 13 yardes $\frac{1}{3}$ be worthe 22 li. 10 s, how shall I sell 1 yarde to gayne $\frac{1}{3}$, or to make of 3, 4: which is all one. *Answere*, say by the rule of three, if 3 doo yelde 4, what will $22\frac{1}{2}$ yelde? multiply & diuide & you shall finde 30 li. Thē say againe by the rule of thre, if 13 yardes $\frac{1}{3}$ doe giue 30 li. as well of principall as of gaine: what will

1 yarde be worthe by the price? Multiply and diuide, and you shall finde 2 li. 5 s. & for that price must the yarde be solde to gaine the $\frac{1}{3}$, or to make of 3, 4.

$$\frac{180}{\frac{3}{1} \times \frac{4}{1}} \quad 6 \qquad \frac{45}{22\frac{1}{2}} \,\Big|\, \frac{\cancel{1}\cancel{8}\cancel{0}}{\cancel{6}\cancel{6}} \,(30.$$

$$90$$

$$\frac{40}{13\frac{1}{3}} \times \frac{30}{1} \quad 40$$

Or otherwise, take the $\frac{1}{3}$ part of 22 li. 10 s. whiche is 7 li. 10 s. that shall you adde with 22 li. 10 s. and you shal haue 30 li. as before. Then diuide 30 by 13 $\frac{1}{3}$, and you shall finde 2 li. 5 s as aboue is saide

li.	sh.
22.	10.
7.	10.
30.	00.

2. If one yarde be worth 27 s. 6 d. for

for how much ſhall 16 yards $\frac{2}{3}$ be ſold to gaine 2 s̄. vpon ẏ pound of money? that is to ſay, vpon 20 s̄.? *Anſwere* add 2 s̄. vnto 20, and you ſhall haue 22, than ſaye: if 20 s̄. principall, doe giue 22 s̄. principall, and gaine: how much will 27 s̄. 6 d̄. principall yeld? Multiply and diuide and you ſhall finde 30 s̄. $\frac{1}{4}$: then ſay againe by the rule of thre. If 1 yarde do giue me 30 s̄. $\frac{1}{4}$ (which is as well the principal as the gaine) what ſhall 16 yards $\frac{2}{3}$ giue me? Multiplye and diuide, and you ſhall finde 25 li. 4 s̄. 2 d̄. For the ſame price ſhall the 16 yardes $\frac{2}{3}$ be ſold to gaine after the rate of 2 s̄. vpon the pound of money, or vpon 20 s̄. which is all one.

$\frac{20}{1} \times \frac{22}{1}$ $\frac{55}{27\frac{1}{2}}$ | $\frac{1}{1} \times \frac{121}{30\frac{1}{4}}$ $\frac{50}{16\frac{2}{3}}$

3. If 10 yardes $\frac{2}{3}$ be worth 25 li. 10 s̄. for howe muche ſhall 2 yardes $\frac{1}{4}$ be ſolde, to gaine after 10 li. vpon ẏ 100 li. of money. *Anſwere:* ſay if 100 principall yelde 110, as well principall as

gaine, how muche will 25 li. 10 shil. yelde me? Multiply & diuide, and you shall finde 28 li. 1 s. Then saye if 10 yardes $\frac{2}{3}$ do yeld me 28 li. 1 s. as well principall as gaine, how much shall 2 $\frac{1}{4}$ yelde me? Multiply and diuide and you shall finde 5 li. 18 s. 4 d. $\frac{1}{12}$, and for so much shal the 2 yards $\frac{1}{4}$ be sold, to gaine after 10 li. vppon the 100 li. of money.

$$\frac{100}{1} \times \frac{110}{1} \qquad \frac{51}{25\frac{1}{2}}$$

$$\frac{32}{10\frac{2}{3}} \times \frac{561}{28\frac{1}{20}} \qquad \frac{9}{2\frac{1}{4}}$$

And although that in these questions of gaine and losse, sometimes the first number is not like vnto the third number, that is to say, of the same denomination: for whereas one woulde say: if 20 s. gaine 2 s. what shal 50 li gaine? or what shall 25 li. gaine. &c. Or if 20 li. do gaine 2 li. what shall 25 shil. gaine? or what shall 27 shil. $\frac{1}{2}$

gayne

gaine? yet the same dothe not proue that the rule is therefore false. For if 20 s. do gaine 2 s. 20 li. shall gaine 2 li. & 20 d. shall gaine 2 d. likewise 20 crownes, shall gaine 2 crownes: and so of all other. Therfore it is to be vnderstande, that the firste number of the rule of three in these reasons, is purposed to bee semblable or like to the third, in qualitie or name.

When one Marchant selleth wares to another, and he giueth to the buyer 2 vpon 15: how much shall the buyer gayne vpon the 100: after the rate? *Answere*: first adde 2 vnto 15 & they are 17, then saye if 15 giue 17, what shall 100 giue? Multiply and diuide and you shal finde 113 $\frac{1}{3}$, so the buyer getteth after the rate of 13 $\frac{1}{3}$ vpon the 100.

15. | 17. | 100.

4. If one northen dosen cost me 3 li. 5 s. I sel the same againe for 3 li. 12 s. 6 d. how much doe I gaine vppon the pound of money after the rate? *Answ*

say if 3 Li. $\frac{1}{4}$ do giue 3 Li. $\frac{5}{8}$ what shall $\frac{20}{1}$ giue? put yͤ whole nūber into their broken & you shall haue $\frac{13}{4} \times \frac{29}{8}$. $\frac{20}{1}$ then multiply 4 times 29, by 20: and thereof commeth 2320: for your nūber that is to be diuided, likewise multiply 13 times 8, 1 time: and thereof commeth 104. Then diuide 2320. by 104, and you shall finde 22 s. $\frac{4}{13}$. So I shall get 2 s. $\frac{4}{13}$ vpon 20 s. or vpon the pound of money.

$\frac{13}{3\frac{1}{4}} \times \frac{29}{3\frac{5}{8}}$ $\frac{20}{1}$

If a yarde of cloth cost me 7 s. 8 d. and afterward I sell of the same cloth 13 yardes $\frac{1}{4}$ for 4 Li. 13 s. 4 d. I would know whether I doe winne or lose, & how much vpon the 100 Li. of money? *Answere*, see firste at 7 s. 8 d. the yarde what the 13 yardes $\frac{1}{4}$ shall coste, and you shall finde 5 Li. 1 s. 7 d. And I sold the same but for 4 Li. 13 s. 4 d. So that I do lose vpon the 13 yardes $\frac{1}{4}$, the summe of 8 s. 3 d. Then if you will know how

much

muche is lost in the 100: saye by the rule of three, if 5 li. 1 s. 7 d. do lose 8 s. 3 d. what will 100 li. lose? First, put 1 s. 7 d. into ye part of a li. and it will be $\frac{19}{240}$. Likewise put 8 s. 3 d. into the part of a li. & it is $\frac{33}{80}$. Then will your nūbers stand thus: $5\,\frac{19}{240} \times \frac{33}{80} \quad \frac{100}{1}$ reduce the whole into his broken, and then multiply and diuide, so you shall finde 8 li. $\frac{1184}{9752}$ which fractiō is worth 2 shil. 5 d. $\frac{169}{1219}$ and so muche is loste in the 100 li. of money.

$$\overset{1219.}{5\,\frac{19}{240}} \times \frac{33}{80} \qquad \frac{100}{1}$$

6. More if 12 yardes $\frac{1}{2}$ of scarlet, be solde for 30 li. 15 s. vpon the whiche is gayned after the rate of 11 $\frac{1}{9}$ vpon the 100: I demaunde what the yarde did cost at the first? *Answere*, from 30 li. 15 s. subtract his $\frac{1}{10}$ parte which is 3 li. 1 s. 6 d. and there resteth 27 li. 13 s. 6 d. the whiche number multiplied by 2 bringeth 55 li. 7 s. of the whiche number take the $\frac{1}{5}$, which is 11 li. 1 s

and

and 4 d., & $\frac{4}{5}$. Then take agayne the $\frac{1}{5}$ of the saide 11 pounde, 1 shillinge, 4 d. $\frac{4}{5}$ whiche is 2 li. 4 shillinges three pence $\frac{9}{25}$. And so muche did the yarde cost at the first peny.

30 *lib.*	15 *shil.*	0 *d.*
3.	1.	6.
27.	13.	6.
2.	0.	0.
55.	7.	0.
11.	1.	4. $\frac{4}{5}$.
2 *lib.*	4 *shil.*	3 *d.* $\frac{9}{25}$

7. More, if 15 yardes $\frac{3}{4}$ of skarlet, doe cost me 32 li. 13 s. 4 d. And I sell the yarde agayne for 2 li. whether doe I winne or lose, and how muche in or vpon the pounde of money.

Answere: Loke what the 15 yardes $\frac{3}{4}$ are worth at 2 li. the yarde, and you shall finde that they are worthe 31 li. 10 s. But they did cost 32 li. 13 s. 4 d. so that there is losse vpon the whole, 1 li. 3 s. 4 d. Then, to knowe howe

much

muche is lost in the li: say by the rule of three, if 32 li. $\frac{2}{3}$ doo lose 1 li. $\frac{1}{6}$. what will $\frac{1}{1}$ lose? that is to say, what will 1 li. lose? reduce the whole numbers into their broken, and then multiply & diuide, so you shall finde $\frac{21}{588}$ parte of a li. Then multiply 21 by 240 d. bycause so many pence are in a li. and diuide the product by 588, & you shall finde 8 d, $\frac{336}{588}$. whiche beynge abbreuied, doe make $\frac{4}{7}$, and thus you see, ẏ 8 d, $\frac{4}{7}$ is lost in the li. of money.

$$\begin{array}{ccc} 98 & 7 & \\ 32\frac{2}{3} \times & 1\frac{1}{6} & \frac{1}{1}. \end{array}$$

8. If 1 yarde of clothe of tissue, bee solde for 3 li. 15 s. whereupon is lost after the rate of 10 s. in the 100: I demaunde what 12 yardes $\frac{1}{2}$ of the same tissue did cost? *Answere*: adde vnto 3 li. 15 s. his owne $\frac{1}{10}$ parte, whiche is 7 s. 6 d. and all amounteth to 4 li. 2 s. 6 d. then looke what the 12 yardes $\frac{1}{2}$, will amount vnto, after 4 li. 2 s. 6 d. and you shal finde that they will come

to

to 51 li. 11 s̄. 3 d. so muche did the 12 yardes ½ cost.

	12. ½.
3 li. 15 shi. 0 d.	4 li. 2 shi. 6 d.
7. 6.	48. 00. 0.
4 li. 2 shi. 6 d.	1. 10. 0.
	2. 01. 3.
	51 li. 11 shil. 3 d.

9. More, if I sell one wilshire white for 6 li. 12 s̄. wherupon I doe gayne after ẏ rate of 2 s̄. vpon the li. of money: that is to say, vppon 20 s̄. I demaunde what 11 peeces of the same whites did cost mee? *Answere*: from 6 li. 12 s̄. (whiche is 132 s̄.) you shall subtract his $\frac{1}{11}$ parte, that is to say, 12 s̄. and there will remayne 120 s̄. or 6 li. Then see at 6 li. the cloth, what the 11 clothes are worthe, and you shall finde that they are worthe 66 li. And so muche did the 11 clothes coste.

132 shil.	11.
12 shil.	6.
120 shil.	66 li.

10. If I sell 10 elles $\frac{1}{2}$ of Hollande for 22 s. 6 d. whereupon I do lose after the rate of 2 s. in the li. of mony. I demaunde what the elle did cost mee? *Answere:* say by the rule of three, if 18 giue 20 s. what will 22 s. 6 d. giue? Multiply and diuide, and you shall finde 25 s. Then diuide 25 s. by 10 $\frac{1}{2}$. and thereof commeth 2 s. 4 d. $\frac{4}{7}$. So muche did the elle cost.

$\frac{18}{1} \times \frac{20}{1}$ 22 $\frac{1}{2}$.

11. If I sel one cloth for 5 li. where upon I doo lose after 10 in the 100, I demaunde howe muche I shoulde lose or gayne in the 100, yf in case I had solde the same for 5 li. 10 shil? *Answere:* say, yf 90 yelde 100, how muche wil 5 li. giue? Multiply & diuide & you shall finde 5 li. $\frac{5}{9}$. Then say agayne by ỹ rule of three, if 5 $\frac{5}{9}$ come to 5 $\frac{1}{2}$, what wil 100 come to? Multiply & diuide, & you shall finde 99 li. whiche beynge subtracted from 100, there will remayne 1 li; & so much is lost in ỹ 100.

The

The 5. Chapter treateth of lengthes and bredthes of Tapistry, and other clothes.

1. If a peece of tapistry be 5 elles $\frac{3}{4}$ longe, and 4 elles $\frac{2}{3}$ in bredth, how many ells square dothe the same peece conteyne? *Answere:* Multiply the lengthe by the breadthe, that is to say 5 $\frac{3}{4}$, by 4 $\frac{2}{3}$, and thereof will come 26 ells, $\frac{5}{6}$. so many elles square dothe the same peece conteyne.

2. More if a peece of tapistrie do cōteyne 32 elles square, and ye same beinge in length 6 elles $\frac{1}{4}$. I demaunde howe manye elles in breadth the same peece doth conteyne? *Answere,* diuide 32 elles, by 6 $\frac{1}{4}$ and thereof commeth 5 $\frac{3}{25}$. So manye elles dothe the same peece conteyne in breadth.

3. More, a peece of clothe being 13 yardes $\frac{1}{3}$ in length, and 5 quarters $\frac{1}{2}$ a quarter in bredth, how many yards of $\frac{2}{3}$ and $\frac{1}{2}$ of one thirde broad, will the same

same peece make? *Answere*, see first by ÿ 5 reduction what part of a yarde the $\frac{5}{4}$ and $\frac{1}{2}$ quarter be, and you shall finde that they make $\frac{11}{8}$, whiche is 1 yarde $\frac{3}{8}$. Then multiply 13 yardes $\frac{1}{3}$ by 1 yarde $\frac{3}{8}$, & you shal haue 18 yards $\frac{1}{3}$ in square, the which you must diuide by $\frac{2}{3}$ & $\frac{1}{2}$ beinge reduced into one fraction by the fifte reduction: that is to say by $\frac{5}{6}$ (bicause ÿ $\frac{2}{3}$, $\frac{1}{2}$ being brought into one fraction maketh $\frac{5}{6}$) and you shall find 22 yardes. So many yards of $\frac{2}{3}$ and $\frac{1}{2}$ broade doth the same peece conteyne.

4. More a marchant hath bought 4 yardes $\frac{2}{3}$ of cloth, being sixe quarters and halfe one quarter broade, to make him a gowne, the whiche he will line thorowout, with blacke Say of $\frac{3}{4}$ of a yarde broade. I demaunde how much Say he must buy? *Answere*: Multiply the length of the cloth, by the breadth, that is to say $4\frac{2}{3}$, by 1 $\frac{5}{8}$, (which is the sixe quarters $\frac{1}{2}$ a quarter) and thereof commeth 7 yardes $\frac{7}{12}$, the whiche diuide

uide by $\frac{3}{4}$, and you shal finde 10 yards $\frac{1}{9}$. So manye yardes of Say muste he haue to line ye same 4 yards $\frac{2}{3}$ of cloth, beinge of 6 quarters and $\frac{1}{2}$ a quarter broade.

5. More, at 6 s. 8 d. the elle square, what shall a peece of Tapistry coste me, whiche is 5 ells $\frac{1}{2}$ longe, and 4 els $\frac{1}{4}$ broade? *Answere*: multiply 5 $\frac{1}{2}$, by 4 $\frac{1}{4}$, & thereof commeth 23 ells $\frac{3}{8}$ square: then say by the rule of three, if 1 elle square cost mee 6 s. 8 d. what shall 23 $\frac{3}{8}$ ells cost: Multiply and diuide, & you shall finde 7 li. 15 s. 10 d. so muche ye sayd peece of Tapistry did cost.

Or otherwise, by the rules of practise, take the $\frac{1}{3}$ of 23 $\frac{3}{8}$: and you shall finde 7 li. 15 s. 10 d: as aboue is saide.

6. More, a peece of Hollande clothe conteyning 42 ells $\frac{2}{3}$ flemmishe, how many elles Englishe doo they make? Heere you must firste note, that 100 ells Flemishe, doo make but 60 elles Englishe, and so consequentlye, 5 ells Flemishe, doo make but 3 elles Englishe.

English. Therefore say by the rule of three, if 5 ells flemishe do make 3 ells Englishe, howe many elles Englishe will 42 ells $\frac{2}{3}$ Flemishe make? Multiply and diuide, and you shall finde 25 elles $\frac{3}{5}$ Englishe, and so many ells Englishe dothe 42 elles $\frac{2}{3}$ Flemishe conteyne, the like is to be doone of all others.

7. More, I haue bought a peece of Tapistry, beynge 5 elles $\frac{3}{4}$ longe, and 4 elles $\frac{2}{3}$ broade of Flaunders measure, I demaunde howe many elles square it maketh Englishe measure? *Answere*: First, forasmuche as 3 elles Englishe are worthe 5 ells Flemishe, therefore put 3 elles Englishe into his square, in multiplying 3 by it self, whiche maketh 9: likewise multiply 5, in it selfe squarely, and it wilbe 25. Then multiply 5 $\frac{3}{4}$, which is ẏ length of ẏ peece, by 4 $\frac{2}{3}$, whiche is ẏ breadth, & thereof commeth 26 elles $\frac{5}{6}$ square: then say by the rule of three, if 25 elles square of Flemishe measure, be worth

9 elles square of Englishe measure, what are 26 elles $\frac{5}{6}$ Flemishe worth? multiply and diuide, & you shall finde that they are worth 9 elles $\frac{33}{50}$ square of Englishe measure.

8. More at 3 s. 6 d. ye elle Flemishe, what is the Englishe elle worth after the rate? *Answere*: first, say if 5 elles Flemishe be worth 3 elles Englishe, what is 1 elle Flemishe worth? multiply and diuide, and you shall finde $\frac{3}{5}$ of an Englishe elle. Then say agayne by the rule of three, if $\frac{3}{5}$ of an Englishe elle, be worthe 3 s. 6 d. what is 1 Englishe elle worthe? multiply & diuide, and you shall finde 5 s. 10 d. so muche shall the Englishe elle be worthe.

9. More at 6 s. 8 d. the flemishe elle square, what, is ye englishe elle worth? *Answere*, say by the aforesaide reason if 25 elles flemishe square, be worth 9 elles square Englishe, what is 1 elle square flemishe worth? multiply and diuide, & you shall finde $\frac{9}{25}$ of a square Englishe

Englishe elle. Then saye, if $\frac{2}{25}$ of an english ell be worth 6 s. 8 d. what is 1 square elle English worth? multiply and diuide, and you shall finde 18 s. 6 d. $\frac{2}{9}$, so much shall one Englishe elle square be worth.

The sixte Chapter treateth of the reducinge of the pawnes of Genes into Englishe yardes.

Note that 100 pawnes do make 26 yards, & 1 pawne is $\frac{13}{50}$ of a yard after the same rate, and 3 pawnes $\frac{11}{13}$ do make 1 yarde.

Example.

1 I Haue boughte 97 pawnes $\frac{1}{2}$ of Genes veluet & I would know howe manye yardes they will make? *Answere*: saye by the rule of three, yf 100 pawnes do make 26 yards, what will 97 $\frac{1}{2}$ make, multiply and diuide, and you shall haue 25 yardes $\frac{7}{20}$. So many yardes do the 97 pawnes $\frac{1}{2}$ contayne.

Or otherwise, take some other num-

ber at your pleasure, as 25 pawnes, whiche doe make 6 yardes $\frac{1}{2}$ and then say by the rule of three, if 25 pawnes doe make 6 yardes $\frac{1}{2}$, what will 97 $\frac{1}{2}$ pawnes make? Multiplye and diuide, and you shall finde 25 yards $\frac{7}{25}$ as before.

More at 2 shillings 7 d. the pawne of Genes, what will ye English yard be worth after the rate? *Answere*, say by the rule of thre, if $\frac{13}{50}$ of an English yarde be worth 2 shillinges, $\frac{7}{12}$. what is $\frac{1}{1}$ yarde worth? Multiplye and diuide, and you shall finde 9 s, 11 d $\frac{3}{13}$. So much is the English yard worth.

Or otherwise multiply 100 pawnes which is 26 yardes by 2 s. 7 d. & thereof cometh 258 s. 4 d. ye which you must diuide by 26 yardes and shall find 9 s 11 d. $\frac{3}{13}$ as before.

3. If 257 Pawnes $\frac{1}{2}$, be worthe 20 li. 16 s. 8 d. what is one yarde worthe after the rate? *Answere*, say by the rule of three, if 257 $\frac{1}{2}$ pawnes, be worthe 20 $\frac{5}{6}$, what are 3 pawnes $\frac{11}{13}$ worthe?

Multiply

Multiply and diuide, and you shall finde $\frac{1250}{4047}$ parte of a pounde, whiche is worthe 6 s̄. 2 d. $\frac{914}{1339}$, and so muche is one yarde worthe.

The vij. Chapter treateth of Merchandise *solde by waight*.

1. At 9 d. $\frac{1}{2}$, the ounce, what is ye li. waight worthe? *Answere*, saye if $\frac{1}{1}$ giue 9 $\frac{1}{2}$, what will $\frac{16}{1}$ giue? multiply and diuide, & you shall finde 12 s̄. 8 d. so much is the yarde worth?

Or otherwise, by the rules of practise, for 6 pence, take the $\frac{1}{2}$ of 16: whiche is 8 s̄. then for 3 d. take the $\frac{1}{4}$ of 16 s̄. whiche is 4 s̄. Finally, for the halfepeny, take 16 ob. whiche are 8 d. then adde all these numbers togither, and you shal finde 12 s̄. 8 d: as before.

3. More, at 10 d. $\frac{1}{2}$, the ounce: what are 112 li. waight worth after ye rate? *Answere*: reduce 112 li. into ounces, in multiplyinge 112 li. by 16 ounces, & you shall haue 1792 ounces, thē say

by ẏ rule of three, if $\frac{1}{1}$ X 10 $\frac{1}{2}$ 1792/1.
Multiply and diuide, & you shal finde 18816 d. whiche doe make 78 li. 8 s. and so muche are the 112 li. worth after 10 d. $\frac{1}{2}$, the ounce.

4. At 12 s. 8 d. the li. waight, what is the ounce worthe? *Answere*: put 12 s. 8 d. into pence, and you shall haue 152 pence: then say by ẏ rule of three, if 16 ounces cost 152 pence, what shal 1 ounce coste? multiply and diuide, and you shall finde 9 pence $\frac{1}{2}$, so muche is the ounce worthe.

Or otherwise, take the $\frac{1}{4}$ of 12 s. 8 d. for 4 ounces, and thereof commeth 3 s. 2 d. then for one ounce, take the $\frac{1}{4}$ of 3 s. 2 d. and you shall haue 9 d. $\frac{1}{2}$, as before.

5. At 32 li. 10 s. the quintall, that is to say, the 100 li. waight: what is 1 li. waighte worthe after the same rate? *Answere*, put 32 li. 10 s. all into shil. and you shall haue 650 s.

Then say by the rule of three, if 100 giue

giue 650, what will 1 giue, multiplye and diuide, and you shall find, 6 s. 6 d. so much is the li. worth.

6. If one pounde waight of saffron do cost me 18 s. 8 d. what shall 355 li. 10 ounces, cost me by the same price? *Answere*, saye by the rule of three, yf $\frac{1}{1}$ ✕ $18\frac{2}{3}$. $355\frac{5}{8}$. Multiplye and diuide, and you shall finde 331 li. 18 4 d. so much are the 355 li. 10 ounces worth.

Briefe rules of waight.

Who that multiplieth ye pece that 1 li. waighte is worth, by 5, and diuideth the product thereof by 12, he shall finde how manye poundes in money the quintall is worthe, that is to saye, how much the 100 pounde waight is worth.

And contrariwise he that multiplieth the pounds of money that the 100 li. waighte is worthe by 12, and diui-

deth the product by 5 shall finde how manye pence the pounde waighte is worth.

Example.

At 17 pence the pound waight, what is the 100 pounde waighte worth? *Answere*, multiply 17 by 5 and thereof commeth 85 diuide the same by 12, and you shall finde 7 pound $\frac{1}{12}$ in money, which $\frac{1}{12}$ is worth one shilling & eight pence. So much is ye 100 poūds waight worth.

More at 13 li. the 100 li. waight, what is one pounde waight worthe? *Answere*, Multiply 13 by 12, and there of commeth 156: the which diuide by 5, and you shall finde 31 d. $\frac{1}{5}$ which $\frac{1}{5}$ is 2 s 7 d. $\frac{1}{5}$ and so much is one poūd waight worth.

The like is to be done of yardes, ells, or of any other measure, whē we recken but fiue score to the hundred.

Breife Rules for measure.

Who that multiplyeth the pence ye

one elle is worthe, by 2. And diuideth the product by 4, hee shall finde howe many poundes in money the 120 ells are worth, whiche 120 elles we count but for a C. in this place, bycause of worke, which measure is vsed for Cãuas onely.

Or otherwise, yf you diuide the penies, that one elle is worth, by 2: you shall haue in your quotient ỹ poũdes, that the sayde 120 elles are worthe, & yf any thinge remayne, they are parts of a li.

And contrariwise, he that multiplyeth the pounds in money that the 120 elles are worth, by 4, and diuideth the ofcome by 2, shall finde howe many pence the elle is worthe.

Or otherwise, if you multiply the poundes that 120 elles are worth, by 2, you shall finde in the product howe many penies one elle is worthe.

Example.

At ten pence the ell, what are 120 elles worthe? *Answere*, multiply 10 d. by

by 2, and thereof commeth 20. The which diuide by 4, and you shall finde 5 pounde: so many poundes in money are 120 elles worth, at 10 d. the elle.

Or otherwise, diuide 10 penies by 2, and thereof commeth into your quotient 5: whiche 5, dothe represent 5 li. and so many poundes are the 120 ells worthe: as before.

More, at 9 pounde, the 120 elles, what is one elle worthe? *Answere*: Multiply 9 li. by 4, and thereof commeth 36, the whiche diuide by 2, and you shall finde 18 d. so muche is one elle worthe.

Or otherwise, yf you multiply 9 poundes, whiche is the price that the 120 elles are worthe by 2, you shall haue in the product 18: which 18 doth signify the penies that 1 elle is worth, when the 120 elles dothe cost 9 li. as before.

The like is to be done of al manner of wares, whiche are solde after 120. for the hundred.

Briefe Rules for our hundreth waight heere at London, whiche is after 112 lib. for the C.

WHo that multiplyeth ÿ pence that one pounde waight is worthe by 7, and diuideth the product by 15, shal finde howe many poundes in money the 112 li. waight is worthe.

And contrariwise, hee that multiplyeth the poũdes in money, that 112 li. is worthe by 15, and diuideth the product by 7, shall finde howe many pence one li. waight is worth.

Example.

At 9 pence the pounde waight, what is ÿ 112 li. waight worth? *Answere:* multiply 9 d. by 7, and thereof commeth 63: the whiche diuide by 15, and you shall finde 4 li. $\frac{3}{15}$, whiche beynge abbreuied is $\frac{1}{5}$ of a pounde, beynge worthe 4 s. And thus the 112 li. is worthe 4 poundes, 4 shillinges: after the rate of 9 d. the li.

At

At 8 li. the 112 li. waight, what is 1 li. waight worth. *Answere*, Multi. 8 li. by 15, and thereof commeth 120, the whiche diuide by 7, and you shall finde 17 d. $\frac{1}{7}$, so muche is 1 li. waight worthe, when the 112 li. is worth 8 poundes.

The eyght Chapter treateth of tares *and alowances of marchandise sold by waight.*

1. At 12 li. the 100 suttell, what shal 987 li. suttell bee worthe? in giuinge 4 li. waighte vpon euery 100 for tret? *Answere*, add 4 li. vnto 100, and you shal haue 104 Then saye by the rule of three, if 104 be worth 12 li. what are 987 pound waight worth? multiplye and diuide, & you shall finde 113 li. $\frac{23}{26}$. whiche is worth 17 s. 8 d. $\frac{4}{13}$. So much shall ỹ 987 li. waight be worth.

104. | 12. | 987.

1. 2.

2. At 6 s. 8 d. ye pound waight, what shall 345 li. $\frac{1}{2}$ be worth in giuing 4 li. waight vpon euery 100, for the tret. *Answere*: see first by the rule of three, what the 100 pound is worth saying, if $\frac{1}{1} \times 6\frac{2}{3}$. $\frac{100}{1}$. Multiply and diuide, and you shal finde 33 li. $\frac{1}{3}$, then adde 4 li. vnto 100; and they are 104, then say againe by the rule of three, if 104 li. bee solde for 33 li. $\frac{1}{3}$, for how much shall 345 li. $\frac{1}{2}$ be solde? multiply and diuide, and you shal finde 110 li. 14 s. 8 d. $\frac{12}{13}$. For so much shall the 345$\frac{1}{2}$ be solde, at 6 s. 8 d. ye pounde, in geuinge 4 vpon the 100.

3. More if 100 li. be worth 36 s. 8 d. what shal 780 li. be worth, in rebating 4 li. vpõ euery 100, for Tare & Closse? *Ans.* Multiplye 780 by 4, and thereof commeth 3120. The which diuide by 100, and you shall haue 31 li. $\frac{1}{5}$: abate 31$\frac{1}{5}$ from 780, and there wil remaine 748$\frac{4}{5}$. Then say by the rule of three, if $\frac{100}{1}$ do cost 36$\frac{2}{3}$, what will 748$\frac{4}{5}$ cost after the rate? Multiply and diuide so

shal

shal you find 274 s. 6 d. $\frac{18}{25}$, & so much shall the 780 li. cost, in rebatinge 4 li: vpon euery 100, for Tare and Closse.

4. More, whether doth he lose more, that giueth 5 li. vpon the 100, or hee that rebateth 5 li. in the 100, for tare and closse? *Answere*: First, note that hee whiche giueth 5 li. vpon the 100, giueth 105 for 100: and he whiche rebateth 5 li. in the 100, giueth the 100, for 95. Therefore saye by the rule of three, yf 105 be giuen for 100, for how muche shall the 100 be giuen? Multiply and diuide and you shall finde 95, $\frac{5}{21}$, and hee whiche rebateth 5 in the 100, maketh but 95 of a 100: so that he loseth 5 in the 100, and the other whiche giueth 5 vpon the 100, loseth but 4, $\frac{16}{21}$, vpon the 100. Thus you may see that hee whiche rebateth 5 in the 100, loseth more by $\frac{5}{21}$ in the 100, then the other whiche gaue 5, vpon the 100 for tare and Closse.

5. If 100 li. of Allam doo coste mee

26 s. 8 d. how shall I sel ye li. waight, to gayne after the rate of 10 vpon the 100? *Answere*: put 26 s. 8 d. all into pence, and you shall haue 320 d. Then say by the rule of three, if a 100 giue a 110, what shall 320 giue? multiply 320 by 110, and diuide the product by a 100, and you shall finde 352 d. Thē say againe, if a 100 li. be worth 352 d. what is 1 li. worthe? multiply and diuide, and you shall haue 3 d, $\frac{26}{50}$: which $\frac{26}{50}$, is worthe $\frac{1}{2}$, and $\frac{1}{25}$ of $\frac{1}{2}$. That is to say, ye pounde waight shalbe worth 3 d, $\frac{1}{2}$, $\frac{1}{25}$ of a halfepeny, in gayninge 10 vpon the 100.

6. If one pounde waight do cost me 6 s. 10 d. and I sell the same for 7 s. 2 d. I demaund how much I shal gaine vppon the 100 li. of money after the rate? *Answere*, saye by the rule of three if 6 $\frac{5}{6}$ yelde 7 $\frac{1}{6}$: what wil $\frac{100}{1}$ yelde. Put the whole numbers into ther broken, thē multiply and diuide, and you shal find 104 $\frac{36}{41}$, from the which subtract 100, and there resteth 4 li. $\frac{36}{41}$ so much

much is gained vpon the 100 pounde of money after the rate.

7. More, if one pounde doe cost me 5 s. 4 d. and I sell the same agayne for 4 s. 9 d. I demaunde howe muche I shal lose vpon the 100 pounde of money? *Answere*: say, if 5 $\frac{1}{3}$, do giue but 4 $\frac{3}{4}$, what shall $\frac{100}{1}$ giue? Put the whole number into their broken, Then multiply and diuide, and you shall finde 89 $\frac{1}{16}$, the whiche you must subtract from a 100, and there will remayne 10 li. $\frac{15}{16}$, so muche is loste vpon the 100 li. of money.

8. More if the li. waight do cost me 3 s. 2 d. and I sel it againe for 4 s. 4 d, how much shall I gaine vppon 20 s? *Ans*. saye if 3 $\frac{1}{6}$ giue 4 $\frac{1}{3}$, what shall $\frac{20}{1}$ giue? Multiplye and diuide and you shall finde 27 s. $\frac{7}{19}$, from the which abate 20 s: and there will remaine 7 s. $\frac{7}{19}$ which is 4 d. $\frac{8}{19}$ and so much is gained vpon the pound of money, that is to say vpon 20 s.

9. If the pounde waight doe cost me 4 s. 4 d. and I sell it againe for 3 s. 2 d. I demaunde how muche I shall lose in the pound of money? that is to say in twenty shillinges. *Answere*, say if 4 $\frac{1}{3}$ giue but 3 $\frac{1}{6}$ what will $\frac{20}{1}$ giue? multiply and diuide and you shal finde 14 s. $\frac{8}{13}$ the which you muste abate from 20 s. and there will remaine 5 s. $\frac{5}{13}$ which $\frac{5}{13}$ is worth 4 d. $\frac{8}{13}$ of a penny and so much is lost vpon the pound of money.

The ix Chapter treateth of certayne *questions, done by the double rule, and also by the rule of three composed.*

10. A Merchant hath solde wines for ye sume of 300 poundes, and he hathe gained therein, after 10 li. vpon the 100 li: The question is to knowe, howe muche he gayned in all? *Answere*, say by the Rule of three, yf a 110 li. doo gaine 10 li. what will 300 li. gayne: multiply and diuide, & you

shall finde 27 li. $\frac{3}{11}$, and so much hath he gayned in all.

11. A Merchant hath bought a peece of Hampshire Carsey, conteininge 18 yardes, for the price of 4 li. 10 s. The question is to knowe, howe manye yardes hee shall sell for 33 s. 4 d. to gaine 20 s. in ye whole peece? *Answere*, adde 20 s. unto 4 li. 10 s. and they make 5 li. 10 s. Then say by the Rule of three, if 5 li $\frac{1}{2}$ do yelde me 18 yards, what will 1 li. $\frac{2}{3}$ yelde? multiply and divide, and you shall finde 5 yardes $\frac{5}{11}$. And so many yardes shall he sell, to gayne 20 s. in the whole peece.

12. A Merchant hathe sold Sugars for the summe of 600 li. redie money, and he hathe gained in the whole, the summe of 60 li. The question is to knowe, howe muche he hathe gayned uppon the 100 li? *Answere*, first you must subtract 60 li. from 600 li. and there will remayne 540 li. Then saye by the rule of three, yf 540 li. do gaine

60 li. what will 100 li. gaine? multiply and diuide, and you shall finde 11 li. $\frac{1}{9}$. And so muche hathe hee gayned vpon the 100 li.

13. More, if 1 li. waighte of maces do cost mee 5 s. 10 d. and afterwarde I doo sell the sayne for 6 s. the li. to be payd for it at the ende of 3 monethes: I demaũde howe muche I shall gaine vpon 100 li. in 12 monethes after ye rate? *Answere:* say by the first parte of the Rule of three composed: if 5 s. $\frac{5}{6}$ in $\frac{3}{1}$ monthes doo gaine $\frac{1}{6}$ of a shillinge, whiche is 2 d. what will $\frac{100}{1}$ li. gayne in $\frac{12}{1}$ monthes? multiply and diuide, and you shall finde 11 li. $\frac{3}{7}$. And so muche shall I gaine in 12 monthes, after the Rate.

14. More, yf 1 peece of Carsey do cost me 36 s. for what price may I sell the same to be payd for it at the ende of 3 mõthes, so that I may gaine thereby, after the rate of 10 li. vppon 100 li. in 12 monthes? *Answere*, say by the

first parte of the Rule of three compo-
sed, if 100 poundes in 12 monthes, do
gaine 10 li. what will 36 s. gaine in 3
monthes? Multiply and diuide, and
you shall finde $\frac{1080}{1200}$ of a shillinge, the
whiche beynge abbreuied, dothe make
$\frac{9}{10}$ of a shillinge, whiche is worth 10
d. $\frac{4}{5}$. the same you must adde with 36
s. and then you shal haue 36 s. 10 d. $\frac{4}{5}$.
And for that price, I must sel the peece
of Carsey for to gaine therein 10 li.
vpon the 100 li. in 12 monthes, and
giuinge 3 monthes time for the pay-
mente.

15. More, yf 6 yardes of Northerne
Carsey doo coste me 8 s. and I sell 4
yardes of the same Carsey for 6 s. I
demaunde whether I gaine or loose,
and how muche vpon a 100 l. of mo-
ney? *Answere*: Firste you must seeke
what the 4 yardes of Carsey did cost:
saying by ye Rule of three, yf 6 yardes
do cost 8 shillings, what wil 4 yardes
coste? multiply and diuide, & you shall
finde 5 s. $\frac{1}{3}$, and so muche did the saide

4 yardes coste, therefore abate ẏ same $5\frac{1}{3}$, from 6 s. and there wil remayne $\frac{2}{3}$ of a shillinge, whiche $\frac{2}{3}$ is gayned in ẏ same 4 yardes of Carsey. Then say againe by the Rule of three, if $5\frac{1}{3}$, doo gaine $\frac{2}{3}$: what will $\frac{100}{1}$ gaine? multiply and diuide and you shall finde 12 and $\frac{8}{16}$, whiche $\frac{8}{16}$ beinge abbreuied is $\frac{1}{2}$. Therefore it appeareth that I shall gaine 12 li. $\frac{1}{2}$ vpon the 100 li. in sellinge 4 yardes of the saide Carsey for 6 shillinges.

16. More a marchant hathe bought a peece of Damaske whiche coste him 8 s. the yarde readie money, and hee selleth the same agayne to an other Merchant, for 10 s the yarde, but hee geueth two dayes for the payment, ẏ is to say, 2 monthes for the one halfe, and 5 monthes for the other $\frac{1}{2}$. The question is to know, howe muche the saide first Merchant doth gaine vpon a 100 li. in 12 monthes after the rate aforesaide? *Answere*, you must adde ẏ 2 monthes and the 5 monthes bothe together,

together, and they make 7 monethes, whereof you must take the one halfe, whiche is 3 monthes $\frac{1}{2}$. And at that time, the seconde Merchant ought to haue payed the whole, at one entier payment: and therefore say by the first parte of the Rule of three composed. Yf $\frac{8}{1}$ s. in 3 $\frac{1}{2}$ monthes, doo gaine $\frac{2}{1}$ s. what will $\frac{100}{1}$ gaine in $\frac{12}{1}$ monethes? multiplie and diuide, and you shall finde 85 li. $\frac{5}{7}$. And so muche dothe the firste Merchant gaine vpon the 100 in 12 monthes.

17 A marchaunt hath boughte veluet at 13 s. 6 d. the yarde redie money, and hee selleth the same for 14 s. 3 d. the yarde, to be paide $\frac{1}{3}$ part in ready money, $\frac{1}{4}$ part at 3 monethes, and the rest which is $\frac{5}{12}$, is to be paide to him at 5 monethes. The question is to know how much ye first marchant doth gaine vppon the 100 li. in 12 monethes, after the same rate? Answere, see first at what time all the payments ought to be paide at once: and for to know the same

same you must multiply euery seueral payment, by the time it oughte to bee payde. and add thẽ togither, thẽ diuide the product by the totall summe of all the payments beinge added togither. And your quotient will shew at what time al ẏ payments ought to be paide at once, as in ẏ former example, $\frac{1}{3}$ parte in readye money is not multiplied by any time, bycause it is payd presently then $\frac{1}{4}$ parte beinge multiplyed by 3 monethes maketh $\frac{3}{4}$ of a moneth, and the rest beinge $\frac{5}{6}$ multiplied by 5 monethes bryngeth 2 $\frac{1}{12}$, then adde $\frac{3}{4}$ and 2 $\frac{1}{12}$ togither, and they make 2 monethes $\frac{5}{6}$, ths whiche is the iuste time, that all the paymentes ought to be paied at once. And therefore say by the first part of the rule of thre composed. If 13 $\frac{1}{2}$ in 2 monethes $\frac{5}{9}$, do gaine $\frac{3}{4}$ of a poũd, what will 100 li. gaine in 12 monethes after the rate? multiplye and diuide, and you shall finde 23 li. $\frac{09}{17}$. And so much doth he gaine vppon the 100 li. in 12 monethes.

18. A marchant hath bought fusteans which cost him 22 s. 6 d. the peece ready money, and he will sell the same at 24 s. the pece. The questiõ is to know what tyme he oughte to geeue for the payment of the same, to thende he may gaine after 9 li. vpon the 100 li. in 12 monethes? *Answere*, say if 22 $\frac{1}{2}$ doe gaine 1 $\frac{1}{2}$: what will $\frac{100}{1}$ gaine? multiply & diuide, & you shall finde 6 $\frac{2}{3}$ of gaine. Then say againe by the rule of three, if $\frac{9}{1}$ of gaine do require $\frac{12}{1}$ what wil 6 $\frac{2}{3}$ of gaine require? multiply and diuide, & you shall find 8 $\frac{8}{9}$, which is 8 monthes & $\frac{8}{9}$. And so long time, ought he to giue, to gaine after ye rate of 9 li. vpon the 100 li. in 12 monthes.

19. A marchant hath bought a peece of Satten beinge in length 20 yardes which did cost him 12 pounds and 10 shil. ready money. I demaũd for what price he shall sell the yarde, to be paide at the ende of 2 monthes, so yt he may gaine after the rate of 10 li. vppon the 100 li. in 12 monethes? *Answere*, see first

first what the yarde did cost him at the first, sayinge by the rule of three, if 20 yardes cost 12 li. 10 shil. what will 1 yarde cost? multiply and diuide, & you shall finde 12 shil. and 6 d. Then saye againe by the rule of three, if 12 monethes, do giue me 10 li. what will 2 monethes geue? multiplye and diuide and you shall finde 1 li. $\frac{2}{3}$. Adde therefore the sayde 1 $\frac{2}{3}$ vnto 100. and they are 101 $\frac{2}{3}$. Say therefore once againe, by the rule of three, if $\frac{100}{1}$ do giue me 101 $\frac{2}{3}$ what will 12 $\frac{1}{2}$, geue? multiply and diuide, and you shall finde 12 shi. and $\frac{17}{24}$ is worth 8 d. $\frac{1}{2}$ and for 12 shil. 8 d. $\frac{1}{2}$ must he sell the yarde of satten, geuing 2 monethes tyme for the payment to gaine after the rate of 10 li. vpon the 100 li. in 12 monethes.

20. More if 1 li. waight of Sinamō do cost me 8 s. ready money, for what price shall I sell 100 li. waight of the same, to be paide the $\frac{1}{4}$ at 1 monethe & the residue at the ende of 3 monethes, so that I may gaine after 9 li. vppon

the

the 100 li. in 12 monethes after the rate? *Answere*, seke first in how longe time, both the paymentes should be made

$$\begin{array}{ccc} \frac{1}{4}. & \frac{1}{1}. & \frac{1}{4}. \\ \frac{3}{4}. & \frac{3}{1}. & 2\frac{2}{4} \\ \hline & & 2\frac{1}{2}.\ \textit{moneth} \end{array}$$

at once. The which to doe: you muste multiply each paiment of money, by yͤ time when it oughte to be paide, that is to say, you must multiply the firste payment which is $\frac{1}{4}$ part by $\frac{1}{1}$ moneth & therof cōmeth $\frac{1}{4}$ of a moneth. Likewise you must multiply yͤ next paimēt which is $\frac{3}{4}$ by 3 moneths, & therof wil come 2 monethes $\frac{1}{4}$. Then adde $\frac{1}{4}$ of a moneth, and 2 monethes $\frac{1}{4}$ both togither, & they make 2 moneths $\frac{1}{2}$ which is the time, that bothe the paimentes oughte to be paide at once. Then saye by the rule of three, if 12 monethes do geeue 9 li. what will 2 monethes $\frac{1}{2}$ geue? multiplye and diuide, and you shall finde 1 $\frac{7}{8}$, say agayne by the rule of three. If 1 li. waight do cost me 8 s. what will 100 li. cost? multiplye and diuide, and you shall finde 40 pound.

Then

Then say once againe yf $\frac{100}{1}$ do giue $101\frac{7}{8}$, what will $\frac{40}{1}$ giue? Multiply & diuide and you shal finde $40\frac{3}{4}$. And for 40 li. 15 s. I must sell 100 pound waight of Sinamon, to be paide at ye 2 seuerall times afore saide, to gaine there in after the rate of 9 li. vppon 100 li. in 12 monethes as by example aforesaide.

20. When the quarter of wheat doth cost 6 s. 8 d. the loafe of bread waying 20 ounces, is solde for a halfepeny, I demaunde that if the quarter of wheat did cost ten shillinges, for how muche shall the loafe of breade be solde, that wayeth 16 ounces? you shall answere by the firste parte of the Rule of three composed, whiche is mentioned in the seconde Chapiter of the thirde parte of this booke, where you must say by the same first parte of the rule of 3 cōposed, if $6\frac{2}{3} \mid \frac{20}{1} \mid \frac{1}{2} \mid \frac{10}{1} \mid \frac{16}{1}$.

Then multiply the first number by the seconde, and the product thereof shalbe your diuisors, Likewise multiply

ply the other three numbers the one by the other, and the product thereof shalbe your diuidende: as thus, firste multiply $6.\frac{2}{3}$ by $\frac{20}{1}$, and thereof commeth $\frac{400}{3}$ for your diuisor, then multiply $\frac{1}{2}$ by $\frac{10}{1}$ and the product thereof by $\frac{16}{1}$, so you shall haue $\frac{160}{2}$ for your nūber that is to bee diuided, then diuide $\frac{160}{2}$ by $\frac{400}{3}$, and thereof commeth $\frac{480}{800}$, the whiche beyng abbreuied bringeth $\frac{3}{5}$ of a peny: and for that price must the loafe of bread be solde, which wayeth 16 ounces, whē the quarter of wheat is worthe 10 shillinges.

Or otherwise by the Rule of three at two times. Firste say, if $\frac{20}{1}$ ounces giue $\frac{1}{2}$, what wil $\frac{16}{1}$ ounces giue? multiply and diuide, and you shall finde $\frac{2}{5}$ of a peny. Then say againe, yf $6.\frac{2}{3}$ doo giue mee $\frac{2}{5}$, what will $\frac{10}{1}$ giue? Multiply and diuide, and you shall finde $\frac{3}{5}$ of a peny, as afore is sayde.

21. When ẏ cariage of one hundreth waight of marchādise 50 miles, doth cost 5 s. what shall the cariage of 500 waight

waight cost me for 16 miles? *Answere*, By the first part of the rule of 3 composed, sayinge if 100| 50| 5| 500| 16. Multiply 100 by 50, the product will be 5000, whiche shall be your diuisor. Then multiply 5 times 500 by 16, & thereof commeth 40000 for your diuidend. Therefore diuide 40000 by 5000, and you shall finde 8 s. so much shall coste the carriage of 500 waight 16 miles.

Or otherwise by the double rule of three, that is to say by the rule of three at two times: first say, if 50 miles doo pay 5 s. what shal 16 miles pay? multiply and diuide, and you shall finde 1 s. $\frac{3}{5}$. Then say againe, if 100 waight doo coste mee 1 s. $\frac{3}{5}$, what shall 500 waight cost? Multiply and diuide, and you shall finde 8 s: as before.

22. When the cariage of 100 pound waight of marchādise 84 miles, doth cost me 6 s, howe manye miles may I haue 64 pounde waight, caried for 3 s 4 d. *Answere*: by the seconde part of ye rule

rule of three composed, and saye if $\frac{100}{1} \mid \frac{84}{1} \mid \frac{6}{1} \mid \frac{64}{1} \mid 3\frac{1}{3}$.

Then multiply the fourth number $\frac{64}{1}$, by the third number $\frac{6}{1}$, and thereof cometh $\frac{384}{1}$ for your diuisor. Likewise multiply $3\frac{1}{3}$ by $\frac{100}{1}$, and by $\frac{84}{1}$ & you shal haue in the product $\frac{8400}{3}$: then diuide $\frac{8400}{3}$ by $\frac{384}{1}$ & you shall finde 72 miles, & $\frac{11}{12}$ of a mile. So many miles shall the 64 li. waight be caried, for 3 shil. 4 d.

Otherwise by the rule of three, at two times: First, saye if 100 waight do cost me 6 s. what shall 64 pounde waight cost? Multiply and diuide and you shall find 3 s. $\frac{21}{25}$. Then say if 3 $\frac{21}{25}$ be payd for 84 miles cariage: for how many miles shal 3 s. $\frac{1}{3}$ be payd? Multiply and diuide and you shall find 72 miles $\frac{11}{12}$ as before.

23. If 100 horses, in 100 daies, doe spend 180 quarters of otes: how manye quarters of otes will 350 horses spend in 150 dayes? *Answere*: by the first part of the rule of three composed you must multiply 180 times 350, by

150:

150: and diuide the producte by 100 times 100: and you ſhall finde 945 quarters. So many quarters of otes will 350 horſes ſpende, in 150 daies.

Or otherwiſe by the rule of 3 at two times: firſt ſaye, if 100 daies do yelde me 180 quarters of otes: what ſhall 150 daies yelde? multiply and diuide and you ſhall finde 270 quarters: thẽ ſay againe, if 100 horſes do ſpẽd 270 quarters of otes, how many quarters of otes will 350 horſes ſpend? Multiply and diuide, and you ſhal find 945 quartes as before.

The tenth Chapter treateth of the *rule of felowſhip, with out any time limited.*

THE rule of felowſhip is thus: you muſt ſet downe each mans ſumme of money that he laieth into cõpany, euery one directlye vnder the other, ẏ which ſummes you ſhall adde all togither, and the totall ſumme

summe of all their whole stocks being thus assembled, shalbe your common diuisor, to the findinge oute of euerye mans part of the gaine. Thē you shal multiply either ẏ gaine, or ells ẏ losse which soeuer of them doth happen by eache mans portiō of money ẏ he layd in, and diuide the products by the sayd diuisor: so shall you haue in your quotient euery mans part of the gaine, if any thing be gained, or els of the losse if any thing be lost.

Example.

1. Two Marchantes haue layde their money in company togither, the first layde in 500 li. The seconde layd in 300 li. and with occuppinge they haue gained 60 li. I demaunde, howe muche eche man shall haue of ẏ same gaines accordinge to the money that he laide in: *Answere*, Adde 500 and 300 bothe together, whiche are the percels or summes that they both laid in, and thereof commeth 800 for your diuisor: then say by the Rule of three,

yf 800 li. (which is their whole stock) doo gaine 64 li. what shall 500 li. gaine? (whiche is the first mans money that he laide in) multiply and diuide, and you shall finde 40 li. for the first mans parte of the gaine: then say if 800 giue 64, what will 300 giue? Multiplie and diuide, and you shall finde 24 li. for the seconde mans parte of the gaine.

500			
300	800	64	500.
800			
	800	64	300.

Or otherwise, put 500 li. which is the first mans money that he laied in, ouer the 800 li. whiche is ye whole stocke, & you shall haue $\frac{500}{800}$, whiche beinge abbreuied, do make $\frac{5}{8}$, and such part of ye gaine shall the first man take, that is to say $\frac{5}{8}$ of 64 li. whiche is 40 li. And consequentlie, by the same maner, the second shall take the $\frac{3}{8}$ of 64, which is 24 pound, for his part of the gaine as before.

before.

$$\frac{5}{8}\Big|\frac{00}{00}\quad\Big|\quad\frac{3}{8}\Big|\frac{00}{00}$$

2. Two Merchants haue companied together, the first laide in 640 Li. & he taketh $\frac{5}{8}$ partes of the gaine. I demaunde how muche the second Merchant layed in? *Answere*, Seynge that the first Merchant taketh $\frac{5}{8}$ of ye gaine, it foloweth that the seconde Merchāt must haue $\frac{3}{8}$, whiche is the rest, and therefore say by the rule of three, if $\frac{5}{8}$ of the gaine, whiche the firste man taketh, did lay into the stock $\frac{640}{1}$. Howe muche shall $\frac{3}{8}$ of ye gaine lay in, whiche is the seconde mans gaine? Multiply and diuide, and you shal finde 384 Li. so muche ought the seconde man to lay into company.

3. Two Merchants haue companied together, the first man laied in 640 Li. and the seconde hathe laide in so muche money for his parte that hee must haue 60 Li. for his parte of 100

Li.

li. that they haue gained. I demaunde howe muche the seconde man did laye into company? *Answere*: seynge that the seconde man taketh 60 li. of the gaine, it foloweth that the first must haue the rest of the 100 li. whiche is but 40 pounde. Therefore say by the rule of three, if 40 li. doo lay in 640 li what shall 60 li. lay in? Multiply and diuide, and you shall finde 960 li. so muche did the seconde Merchant lay in.

4. Two Merchants haue companied togither, the first laide in 83 li. 6 s. 8 d. the second laide in 170 duckets: & they haue gained 100 li. of the whiche the firste man must haue 60 li. I demaunde what the ducket was worth? *Answere*: seynge that the firste man must haue 60 li. it foloweth that the seconde must haue 40 li. therefore say by the rule of three, if 60 li. of gaine, that the first man taketh, did lay in 83 li. 6 s. 8 d. principall, how muche shall 40 li. gaine put in whiche is the gaine

that the seconde man taketh, multiply and diuide, and you shall finde 55 li. $\frac{5}{9}$, so muche are ye 170 duckets worth. Then put 55 li. $\frac{5}{9}$. into shillings, and you shall haue 1111 s. $\frac{1}{9}$. So then for to knowe what the ducket is worthe, say by the rule of three, if $\frac{170}{1}$ giue 1111. $\frac{1}{9}$, what will $\frac{1}{1}$ giue? Multiplye and diuide, and you shall finde 6 s. 6 d. $\frac{22}{51}$, so muche is the ducket worth.

5. Two merchantes haue companied togither, the seconde man laide in more by 30 li. then did the first man: and they gained 120 li. of the which ye first man oughte to haue 50 li. I demaunde what each of them did lay in? *Answere*: from 120 li. abate 50 li. and there resteth 70 li. for ye seconde mans part: so that by this meane ye seconde man (bycause he layde in 30 li. more then the firste man did, taketh 20 li. more of the gaine: & therefore say by ye rule of thre if 20 li. gaine, did lay in 30 li. principall, howe muche shall 50 li. gaine lay in? Multiply and diuide, & you

you shall finde 75 li. so muche did the first man lay in, and consequently the second layde in 105 li.

6. Two merchants haue companied together, the seconde hath laide in twise so much as ẏ first man did, and 10 li. more: and they haue gained 100 li. of the which, the first ought to haue 32 li. for his parte: I demaunde how muche each of them did lay into cōpany? *Ans.* If it were not for the 10 li. that the second man layd in more then the firste, he shoulde haue had but 64 li. of the gaine, whiche is the double of the firste mans parte. But bicause he laide in 10 li. more, he hath therefore 4 pounde more of the gayne, and therfore say by the rule of three, if 4 li. gaine did laye in 10 li. of principall (which was ouer & aboue the double of the first mans laying in) what shall 32 li. of gaines lay in? which is ẏ first mannes part of the gaines that he taketh. Multiplye and diuide, and you shall finde 80 li. for the firste mannes layinge in: and consequently 170 li.

for the seconde mans portion that he layed in.

7. Two marchants haue companied togither, and they haue gained 100 li. of the which the first must haue after the rate of 10 li. vpon the 100 li. and the seconde must haue after ye rate of 15 li. vpon the 100 li. I demaunde how much each of them ought to haue *Answere*, Put 10 li. for the first manes laying in, and 15 li. for the second manes layinge in. Adde therefore 10 li. & 15 li. togither, and they make 25 li. Then put 10 ouer 25 & it is $\frac{10}{25}$ which beinge abbreuied are $\frac{2}{5}$. Therefore he that taketh 10 li. vpō the 100 li. must haue the $\frac{2}{5}$ of the gayne, which is 40 li. Then put 15 ouer 25 & it is $\frac{15}{25}$ which beinge abbreuied are $\frac{3}{5}$. Therefore the second muste haue $\frac{3}{5}$ of ye 100 li. which is 60 li.

8. Two marchants haue companied togither, the first laid in 46 li. 18 s. and the seconde laide in 33 li. 2 s. so they

they haue gained 30 li. I demaunde how muche euerye man shall haue for his part of the gaine? *Answere*, Adde 46 li. 18 s. & 33 li. 2 s bothe togither: and you shall finde 80 li. for your cōmon diuisor, then say if 80 li. whiche is all their stocke, do gaine 30 li. what will 46: $\frac{9}{10}$ gaine? which is the money that ẏ first mā layed in: Multiply and diuide and you shall finde 17 pounde 11 shil. 9 pence: for the first mās part of the gaine. Then say againe by the rule of three: if 80 li. doe gaine 30 li. what will 33 li. $\frac{1}{10}$ gaine, whiche was the seconde mans money, that he layd in: multiply and diuide, and you shall find 12 li. 8 s. 3 d. for the second mans part of the gaine.

And after the same maner shall you doo, in case ẏ were three or foure merchants that would company togither Adding all and euery of ther summes of money (which they lay into ẏ stoke) into one totall summe: which shall be your common diuisor: & then worke with the rest, as is taught in the for-

 mer

mer question of the rule of company.

Example

9. Thre Merchantes haue companied togither, the first laide in I know not how muche: the seconde did put in 20 peeces of cloth: and the thirde hathe laide in 500 pounde. So at the ende of their company, their gaines amounted vnto a 1000 li. whereof the first man ought to haue 350 pound, & the seconde must haue 400 pounde.

Now I demaunde, how muche the first man did lay in, and for how much the 20 peeces of clothe, were put into company?

Answere.

Seinge that the firste and the seconde Merchants must haue 750 li. for their partes of the gaine. Then the thirde man must haue the reste of the 1000 li. whiche is 250 li. And therefore say by the Rule of thre, if 250 li.

gaine

gaine, bee come of 500 li. principall, of how muche shall come 350 li. gaine: whiche the first man taketh, multiply and diuide and you shall finde 700 li. So muche did the first man lay in: thē say if 250 li. gaine, be come of 500 li. principall, of howe muche will come 400 li. whiche is the gaine that the seconde man taketh. Multiply and diuide, and you shall finde 800 li. For that price were the 20 peeces of clothe laide into company.

10. Three Marchants haue gained 100 li. the first must haue the $\frac{1}{2}$, the second must haue $\frac{1}{3}$. And the thirde must haue $\frac{1}{4}$. I demaunde howe muche euery man must haue of the gaine? *Ans.* Reduce $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$, into a common denomination, after the order of the seconde reduction in Fractions, and you shall finde $\frac{12}{24}$, for the $\frac{1}{2}$, $\frac{8}{24}$, for the $\frac{1}{3}$ and $\frac{6}{24}$, for the $\frac{1}{4}$: Then take 12 for the first mans laying in, 8 for the seconde mans laying in, and 6 for the thirde mans layinge in. The whiche

three

three numbers beinge added together shall be your commō diuisor, and they do make 26. Then multiply 100 li. by 12, for the first man: then againe 100 li. by 8 for the seconde: and laste of all 100 li. by 6 for the thirde man. And diuide ỷ products of euery multiplication by 26. So shall you finde 46 li. $\frac{2}{13}$ for ỷ first mans parte of the gaine, 30 li. $\frac{10}{13}$ for the seconde mans parte, & 23 li. $\frac{1}{13}$, for the thirde mans parte.

11. Two Merchantes haue gained 100 li. the first must haue $\frac{1}{2}$ and 5 li. more, the second must haue $\frac{1}{3}$ and 4 li. more, I demaunde howe muche eche of them shall haue? *Answere*, Firste from 100 abate 5 and 4, whiche are 9, so there will remaine 91, then take ỷ $\frac{1}{2}$ of 100 li. whiche is 50 li. for the first mans layinge in. Likewise, take $\frac{1}{3}$ of 100 li. for the second mans laying in, whiche is 33 li. $\frac{1}{3}$. Then adde 50 li. & 33 li. $\frac{1}{3}$ together, and you shall haue 83 li. $\frac{1}{3}$. for your common diuisor, then multiply 91 pounde by 50, and diuide

by

by 83 $\frac{1}{3}$, and thereof commeth 54 li. $\frac{3}{5}$, vnto the whiche number adde 5, and all is 58 li. $\frac{3}{5}$ for the first mans part of the gaine. Likewise multiply 91 by 33 $\frac{1}{3}$, and diuide by 83 $\frac{1}{3}$, and you shall finde 36 li. $\frac{2}{5}$, vnto the whiche adde 4, and you shall haue 40 li. $\frac{2}{5}$ for the seconde mans parte.

12. Twoo Merchants haue gained 100 li. the first must haue the $\frac{1}{2}$ lesse by 4 pound, the seconde must haue $\frac{1}{3}$ lesse by 2 pounde. I demaunde howe much eche of them shal haue? *Answere*, Adde 4 and 2, with 100, & they make 106. Then take as before is saide, 50 li. for the first man: and 33, $\frac{1}{3}$. for the seconde: and adde them both together, and they be 83 $\frac{1}{3}$, whiche shalbe youre diuisor. Then multiplie 106, by 50, & diuide the product by 83 $\frac{1}{3}$, so thereof commeth 63 li. $\frac{3}{5}$. From the whiche abate the 4 li. lesse that the first man taketh, and then is there remaininge 59 li. $\frac{3}{5}$, for his parte. Likewise multiplie 106 by 33 $\frac{1}{3}$, and diuide by 83 $\frac{1}{3}$,

and

and you shall finde 42 li $\frac{2}{5}$, from the whiche abate 2 li. lesse, and there remaineth 40 li. $\frac{2}{5}$ for the seconde mans parte.

The Rule of Felowship with time.

The moneye that euery man laieth in, must be multiplied by the tyme that it continueth in companye: and of that which cōmeth therof, you shall make their new layings in for each of them: and then multiply the gaines by euery one of them seuerallye, and the ofcomes you shall diuide by all their new layinges in added togither, and then you shall haue proporcionally, each mans part of the gaine according to his layinge in.

Example.

1. Two merchants haue companied togither, the first hath put in ẏ first of January 450 pounde, the seconde did lay in the 2 of May 750 pounde. And

And at the yeares ende, they had gained 100 l. I demaund how much each of them shall haue of the gaine? *Ans.* for asmuch as the first did put 450 li. the first of January, his money continued in company 12 monthes, & therfore multiply 450 by 12 monethes, & thereof commeth 5400, for his newe layinge in. And the second laid in his 750 li. but at the first day of May: so that his money remained in company but 8 mōthes. Therfore multiply his 750 li. by 8, and thereof cōmeth 6000 for his new laying in: Thē add 5400 with 6000, and they make 11400 for your common diuisor: Then multiply 100 li. which is the gaines by 5400: & diuide the product by 11400, & thereof will come 48 li. $\frac{7}{19}$ for the first mās part of the gaine. Likewise multiplye 100 by 6000: and diuide the producte by 1140 and you shall finde 52 $\frac{12}{19}$, & so muche muste the seconde man haue for his part of the gaine.

2. Two merchantes haue companied togither, the firste hath layde in the

first

first of Ianuary, 640 li. The seconde can lay in nothinge vntill the first of April. I demaunde how much he shall then laye in, to the ende that he maye take halfe the gaines? *Answere:* Multiply 640 li. by 12 monethes, that his money abideth in company, and therof will come 7680 li. for his layinge in. And so muche oughte the seconde man to laye in, forbicause he taketh $\frac{1}{2}$ of the gaine. But for that, that he putteth in nothing vntil the first of April his money can be in companye no longer than 9 monethes. And therefore diuide 7680 by 9, and thereof will come 853 li. $\frac{1}{3}$. So muche ought the seconde Merchant to lay in the first of Aprill, to the ende that he may take the one halfe of the gaines.

3. Three Merchants haue companied togither, the first layde in the first of Marche 100 li. The seconde laid in the first of Iune, so much money, that of the gaine, he must haue the $\frac{1}{3}$ parte: and the thirde laide in the first of Nouember

uember so muche money, that of the gaines he must haue likewise $\frac{1}{3}$, & they continued in company, vntill the next Marche folowing. I demaunde how muche the seconde and ye thirde Merchants did lay in? *Answere*, Multiply 100 li. whiche the first man did lay in, by 12 monthes, that his money continued in company, & thereof commeth 1200 for his layinge in, and so muche ought the seconde & the thirde Merchants eche of them to lay in, bycause they parte the gaines by thirdes. But for that, that the seconde Merchant layeth in nothing til the first of June, his money can bee in company but 9 monethes. Therefore diuide 1200, by 9 monthes, & thereof will come 133 $\frac{1}{3}$. And so muche ought the seconde Merchant to lay in. Then, forasmuche as the thirde Merchant did lay in nothinge vntill the first of Nouember: His money abideth in company but ye space of 4 monthes. Therefore diuide 1200, by 4, and thereof commeth 300 li. And so muche ought ye thirde Merchant

chant to lay into company.

4. Three Merchantes haue compa-
nied togither, the first laide in, the first of January 100 Duckets. The second hathe laide in 50 li. ye first of Marche, and the third put in a Jewell the first of July, and at the yeares ende, they had gained 400 crownes: of ye which, the firste Merchante must haue 50 crownes, and the seconde must haue 80. I demaunde what the Ducket was worth, and at what price the Jewell was valued, whiche the thirde Merchant laide in: *Answere*, the first mans money beinge 100 Duckets multiplied by 12 is 1200 Duckets by the rule aforesaide, and hee taketh 50 crownes of the gaine: therefore say, if 50 crownes gaine be come of 1200, whiche was his stocke, of how muche shall come 80 crownes gaine, that the seconde man taketh: multiply and diuide, and you shall finde 1920, for the seconde Merchants laying in. Then saye againe, if 50 crownes bee

come

come of 1200 stocke, of howe muche shall come 270 crownes, whiche the thirde man taketh of the gaine: multiplie and diuide, and you shall finde 6480, for the third Merchants laying in. Then diuide 1920, whiche is the second mans laying in, by 10 months that his money did continue in company, & you shall finde 192 Duckets, whiche are worthe 50 li. bycause hee layed in 50 li. Then diuide 50 li. (beinge first reduced into shillings by the saide 192 Duckets) and thereof will come 5 shillings 2 pence $\frac{1}{2}$. So muche was the Ducket worthe: Finally, diuide 6480, (which is the thirde mans layinge in) by 6 monthes that his Jewell remained in company, and you shall finde 1080 Duckets, and for that price was the Jewell put into companie.

5. Three merchants haue companied togither: The first layd in the firste of January 100 li, and the firste of Aprill he hath takn backe againe 20 li.

The seconde hath layde in the firste of Marche 60 li. and afterwarde he did lay in more 100 li. the first of August. The third layd in the first of July 150 li. And the first of October he did take backe againe 50 li. And at the yeares ende, they founde that they had gayned 160 li. I demaũd how much euery man shall haue of the gaine? *Ans.* Multiply 100 li which the firste man layde in by 12 monethes, and thereof commeth 1200 li. from that number abate 9 times 20 li. which are 180 for that whiche he did take backe againe: and there will remayne 1020, for the firste mans laying in. Then multiply 60 which the seconde man layd in by 10, and you shall haue 600: vnto the which add 5 times 100 li. for ẏ money he layde in more, the firste of Auguste which are 500, so al amoũteth to 1100, for the second mans layinge in? Afterwardes multiply 150 pounde, which the thirde man hath layd in, by 6 monethes, and thereof commeth 900, frõ the which number abate 3 times 50, & they

they are 150 for the money that he did take backe againe the first of October so there will remaine 750. for ye thirde mans laying in. Then proceede with the reste, as is taught in the first question of the rule of Felowship withe time, in addinge 1020, 1100 and 750 altogether: whiche shall be youre Diuisor. Then multiply 160 li. which is the gaine by 1020, by 1100, and by 750: and diuide at euery time by your Diuisor, that is to say, by all their layinges in, added together, whiche is 2870: so you shall finde $56\frac{248}{287}$, for ye first man: $61\frac{93}{287}$, for the seconde: and $41\frac{233}{287}$ for the thirde man.

6. Two Merchants haue companied together, the first hath laide in 960 pounde, for the space of 12 monthes, and he ought to haue 8 pounde vpon ye 100 pounde of ye gaine. The seconde hathe laide in 1120 li. for the space of 8 monthes, and hee ought to haue after 12 pounde vpon the 100 pound of the gaine.

And at the yeares ende, they haue gained 800 li. I demaūde how much eche of them shall haue of the gaine? *Answere*, multiply 960 that the first man did lay in by 12 monthes, and ẏ product therof, multiply againe by 8, and you shall haue 92160, for the first mans laying in: then multiply ẏ 1120 that the second hath laied in, by 8 monethes, and that which commeth therof, you shall multiply againe by 12, & you shall finde 107520, for the secōde mans layinge in. Then procede with the rest, as in the firste question of the rule of Felowship is declared, and as in the last Exāple I haue taught you, and you shall finde 369 li. $\frac{3}{13}$ for the first man: and 430 li. $\frac{10}{13}$ for the second man.

The rule of company, betwene *Merchantes and there Factors.*

7. NOte that the estimation of the body, or persone of a Factor, is in

in such proportion to the stocke, which ẏ merchant layeth in, as the gaine of ẏ saide Factor is unto the gaine of the Merchant. As thus, if a Merchant do deliuer into the hands of his Factor 200 li to employ, and he to haue halfe the profite, the person of the said Factor shall bee estemed to be worth 200 li. And if the Factor doe take but the $\frac{1}{3}$ of the gaine, he should haue but $\frac{1}{2}$ so much of the gaine as the merchant taketh which must haue $\frac{2}{3}$: wherfore the persone of the Factor is estemed but the $\frac{1}{2}$ of that which the Merchant layeth in, that is to say 100 li.

And if the Factor did take the $\frac{2}{5}$ of the gaine, then the merchant shal take the residue, which are $\frac{3}{5}$ of the gaine: wherefore the gaine of the Merchant unto that of the Factor, is in suche proportion as 3 unto 2. Then if you will knowe the estimation of the persone of the Factor, saye if 3 giue me 2, what will 200 giue? Multiply 200 by 2 and diuide by 3 so you shall find 133 $\frac{1}{3}$. Or otherwise you must consi-

der that the Factor taketh the $\frac{2}{3}$ of that which the Marchant taketh. And therefore take the $\frac{2}{3}$ of 200, & you shal finde 133 $\frac{1}{3}$ as before: and so much is the persone of the Factour estemed to be worth.

8. And if the Marchant should deliuer vnto his Factor 200 li. and the Factor woulde laye in 40 li. and his persone, to the ende he might haue the halfe of the gaine: I demaude for how muche shall his persone be estemed? *Answere*, abate 40 li. from 200 li. and there will remaine 160 li. And at so much shall his persone be estemed.

And if the Factor would take the $\frac{2}{3}$ of the gaine, his person with his 40 pound, shal be estemed twise as much as the stocke that the marchant layeth in, which should haue but $\frac{1}{3}$ of ẏ gaine, for $\frac{2}{3}$ vnto $\frac{1}{3}$, is in double proportion. Therefore double 200 pounde, and therof commeth 400 li. frō the which abate 40 li. & there will remayne 360 li: But if the Factor woulde take one

ly the $\frac{1}{3}$ of the gaine, that shall be but the $\frac{1}{2}$ of $\frac{2}{3}$ which the marchant taketh: and then the estimation of his person with his layinge in should be estemed but the halfe of ye which the merchant layeth in: you must therefore take the $\frac{1}{2}$ of 200 li. whiche is 100 li. from the which you shall abate 40 pounde, and the rest which is 60 li. is the estimation of his persone.

9. If it so chaunce for to make traf-ficke of 240 li. that the person of the factor should be in such wise esteemed, that hee shoulde haue but the $\frac{1}{4}$ of the gaine, and yet hee woulde haue the $\frac{2}{3}$, I demaunde how muche ready mony he ought to lay in, besides his person: *Answere*, Seinge that his person gayneth the $\frac{1}{4}$, therefore all the whole layinge in, whiche is 240 li. shall gaine ye rest, that is to say ye $\frac{3}{4}$: nowe forbicause $\frac{1}{4}$, is the $\frac{1}{3}$ of $\frac{3}{4}$, therefore his person shalbe estemed the $\frac{1}{3}$ of all the layinge in. Take then the $\frac{1}{3}$ of 240 li. and you shall haue 80 li. for the estimation of

his of his person, and forbicause that hee will haue halfe of the gaine, you shall adde 80 li. with 240 li. & thereof commeth 320 li. of the whiche take the halfe, whiche is 160 li. and from ŷ same you shall abate the 80 li. & there will remaine other 80 li. whiche hee ought to lay in of ready money, and ŷ Merchant must lay in the ouerplus, whiche amounteth to 160 li.

10. A Merchant hathe deliuered to his Factor 1200 li. to gouerne them in ŷ trade of Merchandise, vpon suche condition, that hee for his seruice shall haue the $\frac{1}{3}$ of the gaine, if any thinge be gained, and hee shall beare the $\frac{1}{3}$ of the losse if any thinge bee lost: I demaunde for howe muche his person was esteemed? *Answere*, seeinge that the Factor taketh the $\frac{1}{3}$ of the gayne, his person ought to bee esteemed as muche as $\frac{1}{2}$ of the stocke whiche the Merchant layeth in, that is to say, the $\frac{1}{2}$ of 1200 li. whiche is 600 li. The reason is, forbicause the $\frac{1}{3}$ of the gaine that

that the Factor taketh, is the $\frac{1}{2}$ of the $\frac{2}{3}$ of the gaine that the Merchant taketh. And so the Factor his person is esteemed to be worthe 600 li.

11. A Merchant hathe delivered unto his Factor 1200 li. and the Factor layeth in 500 li. and his persō. Now, bycause hee layeth in 500 li. and his person, it is agreed betweene them, ỹ he shall take the $\frac{2}{5}$ of the gaine: I demaunde, for howe muche his persone was esteemed? *Answere*, Forasmuche as the Factor taketh the $\frac{2}{5}$ of ỹ gaine, he taketh the $\frac{2}{3}$ of that which the Merchant taketh, for $\frac{2}{5}$ are the $\frac{2}{3}$ of $\frac{3}{5}$: and therefore the Factors laying in, ought to be 800 li. which is the $\frac{2}{3}$ of 1200 li. that the Merchant laide in. Then abate 500 li. which the Factor did lay in, from 800 li. whiche should bee his whole stocke, & there remaineth 300 li. for the estimation of his person.

12. More, a Merchant hathe delivered unto his Factor 1000 li. upon suche

such condition, that the Factor for his paines and seruice, shall haue ẏ gaines of 200 li. as though hee laide in so muche ready money: I demaunde what portion of the gaine the said Factor shall take? *Answere*, See what parte the 200 li. (whiche the Factor layde in) is of 1200, whiche is the whole stocke of their company, & you shall finde that it is the $\frac{1}{6}$, and suche parte of ẏ gaine shall the Factor take.

But incase, that in makinge theire couenantes, it were agreed betweene them, that the Factor shoulde haue the gaine of 200 li. of the whole stocke, whiche the merchant layeth in, that is to say, of the 1000 li. Then should the Factor take the $\frac{1}{5}$ of the gaine: for 200 li. is the $\frac{1}{5}$ of a 1000 li.

The xj. Chapter treateth of the *Rules of Barter: that is to say to chaunge ware for ware, &c.*

1. TWoo merchantes will change their merchādise, the one with the

the other. The one of them hath cloth of 7 s. 1 d. the yarde, to sell for reddy money, but in barter he will sell it for 8 s. 4 d. The other hathe Sinamon of 4 d. 7 d. the li. to sell for reddy money. I demaunde howe hee shall sell it in barter yͤ he be no loser? *Answere:* saye, if 7 $\frac{1}{12}$, (whiche is the price that the yarde of clothe is worth in reddy money) bee solde in barter for 8, $\frac{1}{3}$, for what shall 4 $\frac{7}{12}$, bee solde in barter, whiche 4 $\frac{7}{12}$, is the price that the li. of Synamon is worth in reddy money, reduce the whole numbers into their broken, and then multiply and diuide, and you shall finde 5 s. 4 d. $\frac{12}{17}$ partes of a peny, and for so muche shall hee sel the pounde of Synamon in barter.

2. Two Merchants wil barter ther merchandise the one with the other, yͤ one of them hathe Chamlets, of 2 li. 18 s. 4 d. the peece to sell for redy money, and in barter he will sell the peece for 4 li. 3 s. 4 d. yͤ other hath fine caps of 35 s. 10 d. the dossen, to sell in barter

ter. I demaunde what the dossen of cappes were worth in ready money? *Ans.* say if 4 li. 3 s. 4 d. which is ẏ ouer price of ẏ peece of Chamlet, become of 2 li. 18 s. 4 d. which was ẏ iust price of ẏ same, of what shall come 35 s. 10 d. which is the ouerprice of the dossen of caps? Multiply and diuide, and you shall finde 25 s. 1 d. and so much are ẏ dossen of caps worth in ready mony.

3. Two Merchantes will chaunge their merchandise the one with the other: the one of them hath Fusteans of 18 s. 4 d. the pece, to sell for ready money, and in barter he will sell the pece for 26 s. 8 d. The other hath tapistrye of 15 d. the elle to sel for ready money, and in barter he will sell it for 20 d. ẏ elle. I demaunde which of them gaineth, & how much vpon the 100 li. of money? *Answere*, say if 18 s. $\frac{1}{3}$ (which is the iust price of the peece of Fustiā) be solde in barter for 26 s. $\frac{2}{3}$: for howe much shall 1 s. $\frac{1}{4}$, (whiche is the iuste price of the elle of tapistry) be solde in barter?

barter? multiply and diuide, and you shall finde 21 d. $\frac{9}{11}$. And he doth ouersell it but for 20 d, so that of 21 d. $\frac{9}{11}$: he maketh but 20 d. And therefore say by the rule of thre, if the seconde marchant, of 21 $\frac{9}{11}$, do make but $\frac{20}{1}$ howe much shall he lose in the $\frac{100}{1}$? multiply and diuide, & you shal find 91 $\frac{2}{3}$, ye whiche beinge abated from 100 there will remaine 8 $\frac{1}{3}$. And after the rate of 8 $\frac{1}{3}$, doth the seconde merchant lose in the 100. And consequentlye, the firste merchant, of 20 d. maketh 21 d. $\frac{9}{11}$ & therfore say againe by the rule of thre, if the first merchant of $\frac{20}{1}$, do make 21 $\frac{9}{11}$ how much shall he gaine vpon $\frac{100}{1}$ Multiplye and diuide, and you shall finde 109 li. $\frac{1}{11}$. And thus the firste merchāt gaineth after the rate of 9 li. $\frac{1}{11}$ vpon the 100 li. of money.

For your better vnderstandinge of these questions, you must note, that when one Merchant gaineth of an other after the rate of 10 li. vpon the 100 li. he gaineth the $\frac{1}{10}$ of his owne principal, and the other whiche loseth *Note.*

after

after the rate of 9 $\frac{1}{11}$, in the 100 li. he loseth the $\frac{1}{11}$ of his principall. And it may be proued thus: when one Merchāt will sell his wares vnto another, whiche wares stande him but in 100 li. and hee will sell them for 110 li. therefore he of his 100 li. maketh 110 li. and so hee gaineth after 10 li. vpon the 100. which is the $\frac{1}{10}$ of his principal, and the other which byeth wares for 110 li. ye cost ye other but 100 li. of the 110 li. he maketh but 100 li. And therefore say by ye rule of 3, if 110 be come of 100, of how much shall come 100? Multiply and diuide, & you shall finde 90 $\frac{10}{11}$, ye whiche abate from 100, and there will remayne 9 $\frac{1}{11}$, which is the $\frac{1}{11}$ of the principal, that the second loseth in the 100 li. as afore is saide. And therefore, who so that will know what one Merchante gayneth of an other, either after the rate of 10 li. vpon the 100 li. whiche is the $\frac{1}{10}$ of his principall, or else after the rate of 20 li. vpon the 100 li. whiche is the $\frac{1}{5}$, or of any other parte, and ye he woulde

likewise

likewise knowe what parte the other loseth of his principall: hee must take for the numerator of the broken number of him that loseth, as much as for him that gaineth, then adde the numerator and the denominator (of the broken number of him that gaineth) bethe together, and make thereof the denominator of the broken number of him that loseth, and thē shall you haue the iust parte of him that loseth: as by example, of him that gaineth after 10 li. vpon the 100 li. whiche is the $\frac{1}{10}$ of his principall: take the numerator of $\frac{1}{10}$ whiche is 1, and make that the numerator of the broken number of him that loseth, then adde 1, whiche is the numerator of the Fraction of him that gaineth with 10, whiche is his denominator, and you shall haue 11 for the denominator of the Fraction of him ye loseth. Then put 1 ouer the 11, and so you shall haue $\frac{1}{11}$. Thus it appeareth when one Merchant gaineth of another after 10 li. vpon the 100 li. he gaineth the $\frac{1}{10}$ of his principall, and ye other

other loseth 9 $\frac{1}{11}$, whiche is the $\frac{1}{11}$ of his principall. And if hee would gaine after 20, vpon the 100 li. whiche is ye $\frac{1}{5}$ of his principall, the other shoulde lose 16 $\frac{2}{3}$. whiche is the $\frac{1}{6}$ of his principall, and so is to bee vnderstande of all other fractions.

4. Two merchantes wyll chaunge their merchandise the one with the other, the one of them hathe Sayes of 20 s: and 10 d. the peece, to sell for readye money: and in barter he will sell the peece for 23 s. 4 d. and yet he will gaine moreouer, after 10 pound vpon the 100 pounde. The other hath woll of 50 s, the 100 waight to sell for readye money. I demaunde how he shall sell C of woll in barter? *Answere*: say if 20 s. 10 d. which is the iust price of the peece of Say, be solde in barter for 23 s. 4 d. for how muche shall 50 shil. (whiche is the iuste price of the C. of woll) be sold in barter? Multiplye & diuide and you shall finde 56 s. Then for bicause ye first merchant will gaine

after

after 10 li. vpon the 100 li. he maketh of his 100 li, 110 li. so ye second merchant maketh of 110 li. but 100 pouñd And therefore say by the rule of 3, if ye seconde merchant of 110, do make but 100, how muche shall he make of 56? Multiply and diuide & you shall finde 50 s. 10 d. $\frac{10}{11}$ of a peny, & for so much shall hee sell the hundred of woll in barter.

5. More, two Marchāts wil change their marchandise, the one with the other, the one of them hathe Taffeta, of 16 crownes the peece, to sell for ready money, and in barter hee will sell the peece for 20 crownes, and yet he will gaine moreouer after the rate of 10 li. vpon the 100 pound. The other hath ginger of 3 s. 9 d. the pounde waight, to sell in barter. I demaunde what ye pounde did cost in ready money? *Ans.* saye if 20 crownes which is ye surprice of the peece of Taffata, become of 16 crownes the iust price, of howe muche shall come 3 s. 9 d. which is ye surprice

of the pounde of Ginger? Multiplye and diuide, and you shall finde 3 shil. Then, for bicause that the Merchante of Taffata will gaine after the rate of 10 vpon the 100: say if 100 doo giue 110: what shall 3 s. giue? multiply and diuide, and you shall finde 3 s 3 d. $\frac{3}{5}$, and so muche did the pounde of Ginger cost in ready money.

6. More two merchants wil change their merchandise, the one with the other, the one of them hath worsteds of 25 s. the peece, to sell for ready money and in barter he will sell the peece for 33 s. 4 d. and yet he loseth after 10 li. in the 100 li. the other hathe waxe of 3 li. 6 s. 8 d. the 100 waight to sell for redy money. I would know for what price he shoulde sell his waxe in barter? *Answere*: say if 25 s. whiche is ye iuste price of the peece of worsted, bee solde in barter for 33 s. 4 d. for howe muche shall 3 pound 6. s 8 d. be solde? whiche is the iuste price of the 100 of waxe, as it was worth in ready mo-

ney. Multiply and diuide, & you shall finde 4 li. $\frac{4}{9}$ which is 8 s. 10 d. $\frac{2}{3}$, then for bicause that the merchant of worsteds, loseth after 10 li. in the 100 li. of 100 li he maketh but 90. And therfore say if 90 giue 100 what giueth 4 pound $\frac{4}{9}$? Multiply and diuide & you shall finde 4 li. $\frac{76}{81}$, which is worth 18 s. 9 d. $\frac{5}{27}$ and for so much shall he sell ẏe 100 pounde waighte of waxe in barter.

7. More, twoo Merchantes will change their merchandise the one with the other, the one of them hath worsteds of 5 li. 6 s. 8 d. the peece, to sell for reddy money, and in barter he will sell the peece for 6 li. 13 s. 4 d. and yet he loseth after 10 li. in the 100, and the other hath Muske of 2 s. 9 d. $\frac{1}{3}$ the pounde waight to sell in barter. I demaunde what the pounde did coste in reddy money? *Answere*: say if 6 li. $\frac{2}{3}$, whiche is the ouerprice of the peece of worsted become of 5 li. $\frac{1}{3}$, whiche is ẏe iuste price of the same, of howe muche

 shall

shall come 2 s. 9 d. $\frac{1}{3}$. Multiplye and diuide, & you shal finde 2 s. $\frac{2}{9}$. which $\frac{2}{9}$ is 2 d. $\frac{2}{3}$: then forbicause that the Merchant of worsteds loseth after 10 li. in the 100 li. of a 100 hee maketh but 90, and therefore say, if 100 giue but 90, how muche shall 2 s. $\frac{2}{9}$ giue? Multiply and diuide, and you shall finde 2 shil. and so muche coste the pounde of Muske in ready money.

Other Rules of Barter, wherein is *giuen some parte in reddy money.*

When a Merchant ouerselleth his merchandise, and he will haue also some parte of his ouerprice in reddy money: as the $\frac{1}{2}$, ye $\frac{1}{3}$, or the $\frac{1}{4}$, &c. He must subtract ye same parte of money from the iust price, & also from the ouer price of his merchandise: and the twoo numbers that remaine after the subtractiõ is made, shalbe the twoo first numbers in the rule of three: and the iust price of the seconde Merchante shall be the thirde numbre:

numbre: to know how muche he shall ouersell the parte of his merchandise.

Example

8. Twoo Merchantes will change their merchandise the one with the other, the one of them hathe fine woll, at 5 li. the 100 li. waight to sell for ready money, and in barter he will sell it for 6 li. and yet hee will haue the $\frac{1}{3}$ in ready money. The other hath cloth of 13 s. 4 d. the yarde to sell for ready money. I woulde know how he shall sell the same in bar: *Answere*, take y^e $\frac{1}{3}$ of 6 li. which is y^e ouerprice of y^e 100 of wolle, and that is 2 li. y^e which you must abate from 5 li. which is the iust price of 100 of woll, and also abate it from 6 li. whiche is the ouerprice, and there shall rest 3 li. and 4 li. for y^e two first numbers in the rule of three, then take 13 s. 4 d. whiche is the iuste price of a yarde of cloth, for the thirde number: Then multiply and diuide & you shall finde 17 s 9 d. $\frac{1}{3}$: for so much shal

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the seconde sell his cloth in barter.

9. More two merchãts will change their merchandise the one with the other, the one of them hath waxe of 3 li. 6 s̄ 8 d̄. the C. to sell for ready money, and in barter hee will sell the same for 4 li. 3 s̄. 4 d̄. and yet he will haue the $\frac{1}{4}$ in ready money: and the other hathe fine Crimson sattine of 15 s̄. the yard to sell in barter. I demaund what it is worth in ready money *Answere*: Take the $\frac{1}{4}$ of 4 li. 3 s̄. 4 d̄. which is 1 li. 0 s̄. 10 d̄. and abate it from 4 li. 3 s̄ 4 d̄. & also from 3 li. 6 s̄. 8 d̄. and ther resteth 3 li. 2 s̄. 6 d̄, and 2 li. 5 s̄. 10 d̄. for the two firste numbers in the rule of three. And 15 s̄. for the thirde number which 15 s̄. is the ouerprice of ỹ yard of Sattine. Then multiply and diuide and you shall finde 11 s̄. And so much did the yarde of Satine cost in readye money.

10. Two Merchants will change theire merchandise the one with the

other

other, the one of them hathe tinne of 50 s. ẏ 100 li. waight to sell for reddy money, and in barter he will sell it for 3 li. 6 s. 8 d. and he will gaine after 10 li. vpon ẏ 100 li. and yet he will haue also the one halfe in reddy mony. The other hathe leade of 3 halfepence the li. to sell for reddy money. I demaũde howe he shall sell ẏ li. of leade in barter? *Answere*: See first at 10 li. vpon the 100 li. what the 3 li. $\frac{1}{3}$, will come vnto, in sayinge by the Rule of three, if 100 giue 110, what will 3 $\frac{1}{3}$ giue? multiply and diuide, & you shall finde that they will come to 3 li. $\frac{2}{3}$, which is 13 s. 4 d. of the which, the halfe which he demaundeth in reddy money, is 36 s. and 8 d. the same beynge abated frõ 50 s. and also from 3 li. 13 s. 4 d. there will remaine 13 s. 4 d. and 1 li. 16 s. 8 d. for the twoo first numbers in the rule of three, whiche you must put all into halfepence, & the aforesaide three halfepence shalbe the thirde number, and thẽ multiply and diuide, and you shall finde 4 d. $\frac{2}{8}$, and for so much shall

 he

he sell the li. of leade in barter.

11. More, two Marchantes will change their merchādise the one with the other, the one of them hathe steele of 16 s. 8 d. the 100 li. waight, to sell for redy money, and in barter he will sell it for 25 s. and yet hee loseth after 10 li. in the 100 li. but hee will haue the ½ in reddy money, the other hathe yron of 6 s. 8 d. the hundred to sell in barter, I demaunde what the hūdred of yron did cost in reddy money? *Ans.* say if 100 come but to 90, how muche shall 25 s. come to? Multiply and diuide, and you shall finde 22 s. 6 d. of the whiche number, take the ½ whiche is 11 s. 3 d. and subtract it from 22 s. 6 d. and also from 16 s. 8 d: and there will remaine 11 s. 3 d: and 5 s. 5 d. for the two first numbers in the Rule of three, and 6 s. 8 d. whiche is the ouer-price of a hūdred of yron, for the thirde number, then multiply and diuide, and you shall finde 3 s. 2 d. $\frac{14}{27}$: & so muche did the hundred of yron caste in reddy money.

12.

12. More two merchants wil chaũg their merchandise, the one with the other, the one of them hath sayes of 20 s. 10 d. the peece to sell for readye money, and in barter he wil sell the peece for 25 s. and he will haue the $\frac{1}{4}$ in ready money: The other hath caps of 35 shil. the dossen, to sell for ready money but he will gaine after the rate of 10 li. vpon the 100 li. I demaunde how he shall sell the dossen caps in barter?

Answere, saye if 100 be worthe 110. what shall 35 s. be worth, whiche is the iust price of the dossen of caps: multiply and diuide, and you shall find 38 shil. 6 d. Thẽ take the $\frac{1}{4}$ of 25 s. which is 6 s 3 d. and subtract it from 20 shi. 10 d. and also from 25 s. and ther will remaine 14 s. 7 d. & 18 s. 9 d. for ẏ two first numbers in the rule of three, and 38 s. 6 d. which is the iust price wyth his gaine in the dossen of caps) for the thirde number: then multiply and diuide, and you shall finde 49 s. 6 d. & for so muche he shall sell the dossen of caps in barter.

The

The 12. Chapter treateth of the exchaunginge of money from one place to another.

First you must note, that at Andwerp they vse to make their accomptes by Deniers de gros, that is to saye by pence Flemishe, whereof 12 doe make 1 s. Flemish, and 20 s. Flemishe do make 1 li. de gros.

Example.

1. If I deliuer in Flaunders 500 li. Flemishe, at 19 s. 6 d. de gros, that is to say at 19 s. 6 d. Flemishe, to receaue 20 s. at London, I demaunde howe much I shall receaue sterling at London for the sayde 500 li. Flemishe. *Answere*, Saye if $19\frac{1}{2}$ giue $\frac{20}{1}$, what will $\frac{500}{1}$ giue? Multiply and diuide, and you shall finde 512 li. 16 s. 4 d. $\frac{12}{13}$ of a penye. And so muche sterlinge shal I receaue in London for my 500 li. Flemishe.

2.

2. If I deliuer in London 375 li. sterling, to receaue in Andwerp 21 s. 9 d. the gros, that is to say, Flemishe, for euery pounde sterling. I demaũde how many poundes Flemishe I shall receaue in Andwerpe, for the said 375 li. sterlinge? *Answere*, say if $\frac{20}{1}$ giue 21 $\frac{3}{4}$, what will $\frac{375}{1}$ giue? Multiply and diuide, and you shall finde 407 li. 16 s. 3 d. So many poundes Flemishe shall I receaue in Andwerpe for the saide 375 li. ster. in Andwerpe.

3. If I take vp money at Andwerp, after 19 s. 6 d. Flemishe, to pay for the same at London 20 s. ster. and when the day of paiment is come, I am forced to retorne the same, and to take vp money againe in London to paye my bill of exchãge, so that for 20 s. whiche I take vp heere, I must pay 19 s. 9 d. at Andwarpe. I demaunde whether I doo winne or lose, and how muche in, or vpon the 100 li, of money? *Ans.* Say, if 19 $\frac{3}{4}$, giue 19 $\frac{1}{2}$, what will $\frac{100}{1}$ giue? multiply and diuide, & you shall

finde

finde 98 $\frac{58}{79}$, the whiche beyng abated from 100, there will remaine 1, $\frac{21}{79}$. And so much doo I lose vpon the 100 pounde of money.

4. If I take vp at London 20 shil. sterlinge to pay at Andwerpe 21 s. 8 d. Flemishe, and when the day of payment is come, my Factor is constrained to take vp money againe at Andwerpe, wherwith to pay the foresaide summe: And there he dothe receaue 22 shill. Flemishe for the whiche I must pay 20 shill. at London. Nowe I demaunde whether I doo winne or lose and howe muche vpon the 100 li. of money after the rate? *Answere*, saye if 21 $\frac{2}{3}$, giue $\frac{22}{1}$. what will $\frac{100}{1}$, giue? multiply and diuide, & you shall finde 101 $\frac{7}{13}$, from the whiche abate 100, & there will remaine 1 $\frac{7}{13}$, and so muche shall I gaine vpon the 100 pounde of money.

The exchange from London into Fraunce, is not like as it is into Flaunders, but is deliuered by the Frenche

crowne

crowne, whiche is worthe 50 souse Tournois the peece.

And heere must you note, that in Fraunce they make their accompte by Deniers Tournois, whereof 12 Deniers maketh 1 souse Tournois, and 20 souse Tournois maketh 1 li. Tournois, which they call a Liure or franc, and the Frenche Crowne is currant among Merchāts for 51 souse Tournois, but by exchange it is otherwise, for they will deliuer but 50 souse Tournois, whiche is 2 li. 10 souse Tournois for a Crowne, and at suche price the Crowne, as the taker vp of money can agree with the deliuerer. Note.

Example.

5. If I deliuer 340 li. ster. heere in London, after 6 s. 4 d. sterlinge the crowne, to receaue at Roan, or at Paris 50 souse Tournois for euery crowne, I woulde knowe how many Liures Tournois I shall receaue there for my 340 li. ster? *Answere:* say

ye

yf 6 s. $\frac{1}{3}$, ster. do giue me 2 li. $\frac{1}{2}$, Tournois, what wil $\frac{6800}{1}$ s. giue, (which is ẏ 340 li. reduced into shillinges, then multiply and diuide, & you shall finde 2684 Liures, $\frac{4}{19}$, whiche is worthe 4 souce $\frac{4}{19}$ Tournois, and so muche shal I receaue in Roan or Parris for my 340 li. sterlinge.

6. If I deliuer in Parris or Roan, or elsewhere in Fraunce 1250 Liures Tournois, at 50 souse Tournois the Crowne, to receaue for euery suche Crowne, 6 s. 3 d. sterling at London. I demaunde how much sterling money I shall receaue at London for my 1250 pounde Tournois? *Answere*: say, if 2 li. $\frac{1}{2}$, doo giue mee 6 s. $\frac{1}{4}$, what will $\frac{1250}{1}$ giue? Multiply and diuide, and you shall finde 3125 s. sterlinge, whiche maketh 156 li. 5 s. sterlinge. And so many poundes shall I receaue at London for the saide 1250 Liures Tournois, after 6 s. 3 d. for euery Crowne of 50 soulze.

The

The 13. Chapter treateth of the *Rule of Alligation, or mixture.*

THe Rule of Alligation is so named, for that it teacheth to alligate or bynde togither diuers percelles of sundrye prices, and to know how much you must take of euery percell, accordinge to the nūbers of the Question, the which rule is distinct into two partes: as foloweth.

The first part of the rule of Alligation, sheweth howe to make a mixture of diuers thinges being of sundry prices: And of the same thinges so mixed, to knowe the common price of the saide mixture.

Example.

1. A man woulde mixe 5 bushels of wheate at 2 s̄. 8 d. the bushell, with 9 bushelles of Rie, at 2 s̄. the bushell, & woulde know how muche the bushell

so mixed doth stand him in, ỳ one with the other? *Answere*, for to knowe the same common price. You must multiply euery thing by his price, and adde all the products togither: the whiche you must diuide by the number of all the thinges that are to be mixed, and the quotient wil Answere to the question, as in the foresaide Example, I multiplye 5 bushels, by his price, that is to say by 2 s̄. 8 d. and thereof commeth 13 s̄. 4 d. Likewise I multiplye 9 bushells by 2 s̄. maketh 18 s̄. bothe these summes added togither, doe make 31 s̄. 4 d. the whiche I do reduce into pence, and they make 376 pence. Thē I diuide 376 by 14 which is the number of al the bushels, and my quotient will bee, 26 pence and $\frac{6}{7}$ and so muche doth one bushell of both the sortes of graine stand him in.

2. If you haue two seuerall things whereof you would mixe equall portions togither you muste adde there prices & take onely ỳ $\frac{1}{2}$, if you woulde

mixe

myxe togithers equall portions of 3 thinges, you must take $\frac{1}{3}$, and of 4 the $\frac{1}{4}$ and so continuinge, as by Example wheat of 2 s. 8 d. the bushell, and Rie of 2 s. the bushell beinge mingled by by equal portions, I add 2 s. 8 d. and 2 s. togither, and they make 4 s. 8 d. wher of the one $\frac{1}{2}$ is 2 s. 4 d. & so much is the valew of one bushell of suche a mixture. And if there were a portion of Barley at 20 d. then I muste adde 2 s. 8 d: 2 s. and 20 d. togither, & they make 6 s. 4 d. whereof the $\frac{1}{3}$ which is 2 s. 1 d. $\frac{1}{3}$ shoulde bee the price of one bushell of that mixture.

3. A marchant hath 27 li. waight of large Cloues at 6 s. the li. 15 li. of the middell sorte at 2 s. 6 d. the li. And 10 li. of fuste at 2 s. 2 d. the li. when all the same are mixed togither, I would knowe how muche the li. is worthe? *Answere*, you must multiplye euerye droog by his price, and then diuide the totall summe of the productes, by the whole waight of the droogs, and you

shall finde 51 d. $\frac{1}{26}$ and so much is the li. of that mixture worth.

27.	at	6 s.	0 d.	162
15.	at	2 s.	6 d.	$37\frac{1}{2}$
10.	at	2 s.	2 d.	$21\frac{2}{3}$
52				$221\frac{1}{6}$

4. And if you woulde mixe $\frac{1}{2}$ large cloues, $\frac{1}{3}$ of middell, and $\frac{1}{4}$ of fust, and you woulde knowe howe muche the pound waight were worth, you must take a number, which conteineth those partes, as for example 12. whereof ye $\frac{1}{2}$ which is 6 shall signify so many li. of large cloues: The $\frac{1}{3}$ which is 4, shal be so many li. of middell, and the $\frac{1}{4}$ which is 3, shall be so many li. of fust. Then afterwards you must multiply euery droog by his price, & diuide the totall summe of all the products, by ye whole summe of the droogs, & you shal finde 4 s. $\frac{1}{26}$. And so much is 1 li. waighte of the mixture.

6.

6.	at	6 sh.	0 d.	36
4.	at	2 sh.	6 d.	10
3.	at	2 sh.	2 d.	$06\frac{1}{2}$
13.				$52\frac{1}{2}$

5. And if you woulde make 100 li. waighte of suche a mixture, you shall worke by the rule of companye, & you shall finde 46 li. $\frac{2}{13}$ of large cloues, 30 li. $\frac{10}{13}$ of middell. And 23 $\frac{1}{13}$ of fust

6	13.	100	6.	Ans. $46\frac{2}{13}$.
4			4.	Ans. $30\frac{10}{13}$.
3			3.	Ans. $23\frac{1}{13}$.
13				100

6. A Goldsmith hath 8 li. waight of silver billio of 7 ounces fine, more 15 li. of 8 ounces $\frac{1}{2}$ fine, & 13 li. waighte of 10 ounces fine, and he will melt all those togither, and make of them one masse. The question is to knowe of what finesse the pounde waighte is? *Answere*: you must multiply the number of the waightes of euery Billion, by his finesse, and thereof will come ẏ

ounces and partes of ounces fine, the which you must adde togither, & they will make 313 ounces $\frac{1}{2}$ of fine, the same you must diuide by 36 which is the whole summe of the pouid waight of Billion, and you shall finde 8 ounc. and $\frac{51}{72}$ remayning, which $\frac{51}{72}$ parts of an ounce is worth 14 penie waight, & 4 graines, and so much is the pounde waight of this mixture worth.

8 *lib.*	*at*	7 *onz.*		*is*	56
15.	*at*	8 *onz.*	$\frac{1}{2}$.	*is*	127 $\frac{1}{2}$.
13.	*at*	10 *onz.*		*is*	130
36.					313 $\frac{1}{2}$.

7. A Goldesmith hathe 3 sortes of Siluer byllion, that is to saye, 5 li. 7 oũces 10 penie waight, at 7 ounces $\frac{1}{2}$ fine: 12 li. 3 oũces, at 6 ounces $\frac{1}{3}$ fine: And 4 li. at 9 oũces fine. All ẙ whiche he wil melte into one masse. The question is to know, of what finesse the poũde waight of that mixture shalbe: *Answere*, you must multiply euery Billion by his finesse, as afore. And adde togither

togither al the products, and they doo amount to 155 li. $\frac{37}{48}$. Then adde all the waightes of the Billions together into one summe, and they make 21 li. $\frac{7}{8}$: diuide then 155 $\frac{37}{48}$, by 21 $\frac{7}{8}$, & youre quotient 7 ounc. and $\frac{1016}{8400}$ remaining, the whiche $\frac{1016}{8400}$, beinge brought into penie waightes and graines, do make 2 penie waight, 10 graines, $\frac{2}{35}$, of a graine fine. So you may perceaue that the same mixture is of 7 ounc. 2 d. 10 graines, and $\frac{2}{35}$ of a graine fine, the pounde waight.

And heere is to be noted, that the reckeninge of the waights for Siluer is thus as foloweth, that is to say, *Note.*

1 li. of Troy waight, maketh 12 ounces.

1 ounce is diuided in 20 penies waight.

1 penie waight, is distributed into 24 graines.

1 graine into 20 smaller partes, &c.

And the reckening for Gold, is thus.

1 ounce of fine Golde without any alloy, is imagined to be 24 karetes.

1 karett is diuided into 4 graines.

1 graine is parted into 2 halfe graines, or 4 quarters of a graine, &c. And so into other smaller partes.

8. But if the saide goldsmith, wolde put 5 li. waight of Copper with the saide Billions, and you wolde knowe of what finesse it is, thẽ must you adde the same 5 li. with the 21 li. $\frac{7}{8}$, and it maketh $26\frac{7}{8}$. Then diuide the aforesaide 155 li. $\frac{37}{48}$, by 26 li. $\frac{7}{8}$, and you shall finde 5 ounces. fine, & $\frac{8216}{10320}$ remayninge, the whiche $\frac{8216}{10320}$ is worth 15 peny waight, 22 graines, and $\frac{6}{43}$. And of that finesse will the same masse be.

9. A Goldesmith hath melted 12 li. waight, and 5 ounces of Golde Billion, beinge of 18 karats fine, with 4 li. waight, 4 ounces and $\frac{1}{2}$, at 21 karats fine, I demaunde of what finesse is 1 li. waight of the same masse? *Ans.*

you

you must multiply the waightes (by the karetts fine) of eche sorte, & adde ỹ productes together, the same you must diuide by the whole summe of all the waightes added together, and youre quotiēt will shew you of what finesse the same is of, as in the former example, I doo multiply 12 li. & 5 oun. by 18 karatts, and thereof commeth 223 karatts $\frac{1}{2}$. Likewise I doo multiplye 4 li. waight, 4 ounces $\frac{1}{2}$, by 21 karetts, and thereof commeth 91 karettes $\frac{7}{8}$, these twoo summes of karetts I doo adde together, and they make 315 karetts $\frac{3}{8}$. Then I do adde 12 li. waight 5 ounc. and 4 li. waight, 4 ounces and $\frac{1}{2}$ together, & they make 16 li. 9 ounc. $\frac{1}{2}$, the which 9 ounces $\frac{1}{2}$ are $\frac{19}{24}$ partes of a pounde: & therefore I diuide 315 $\frac{3}{8}$ by 16 li. $\frac{19}{24}$, and thereof commeth 18 karetts & $\frac{2520}{3224}$ remayning, whiche fraction is 3 graines, and $\frac{51}{403}$ partes of a graine. And of that finesse is 1 li. waight of the saide masse.

A Goldesmith hathe melted 10 li. waight, 7 ounces and $\frac{3}{8}$ of 20 karetts

and $\frac{1}{3}$ fine. And 8 li waight, 2 ounces and $\frac{5}{6}$ partes of 23 karetts fine, with 15 li. waight, 1 ounce of Siluer. The question is of what finesse is ye pound waight of the saide masse? *Answere*, You must multiply the waight of euery sorte of Golde billion by his alloy, that is to say by his finesse, and adde all the productes together: and you shall finde 340 karetts $\frac{25}{432}$, then adde the waight of the two sortes of Golde billion, with the waight of the Siluer togethers, and thereof will come 33 li. 11 ounces, $\frac{5}{24}$, the which 11 ounces $\frac{5}{24}$ is $\frac{269}{288}$ of a pounde waight, then diuide the saide 340 karetts $\frac{25}{432}$ partes, by 33 poundes $\frac{269}{288}$. And you shall finde 10 Karettes $\frac{4205}{263871}$. And of the same finesse shall the pound waight of that masse of golde be.

The second part of the rule of Alligation.

1. A Goldsmith hath 4 sorts of gold The firste is worthe 30 crownes the pound waight, the second is worth 36

crownes

crownes, and the thirde is worthe 42 crownes, and the fourth is worthe 45 crownes, and of these 4 sortes he will make a Scepter of 6 pounde waight, which shalbe worthe 40 crownes the pounde. I demaunde howe muche he must take of euery sort. *Answere*, first you must set down the nūbers whereof you wil make the alligation (which are 30.36,42. and 45 orderly the one vnder the other, after the same maner, as if you would adde them togither: and the common number where vnto you will reduce them, you shall set on the left hand, which common number in this Example is 40. Then marke which of the saide foure numbers, are lesser then that common number, and which of them be greater, and with a draughte of your pen, euermore linke two numbers togither, so that the one be lesser then that common number, & the other greater then it, for two greater, nor two smaller numbers maye not be lynked togither, for they will eyther be lesser, or els greater then the com-

common number: but one greater nū-
ber, and one smaller maye be so mixed
that they will make the common nū-
ber. And twoo greater or two smaller
numbers, can neuer make the cōmō
number in due order, as heareafter
shall appeare.

After ỷ you haue thus linked them,
then marke howe muche eche of the
lesser numbers is smaller than ỷ com-
mon number, and that difference you
shall set against the greater numbers,
whiche bee linked with those smaller,
eche of them with his matche still on
ỷ right hande. And likewise you must
set the excesse of the greater numbers
againste the lesser whiche be combined
with them. Then shall you adde all
those differences into one summe,
whiche shalbe the first number in the
rule of three, and the seconde number
shalbe the whole massye peece ỷ you
will haue of all the perticulers, which
in this example was presupposed to
be 6 li. Then the thirde summe shalbe
eche difference by it selfe, and by them

shal

shal you finde out the fourth number, declaringe the iust portion that you shall take of euery particuler in that mixture, as now by the former example, I will make it more playne.

21. 6. 5. || 21. 6. 2.

21. 6. 4. || 21. 6. 10.

Heere in this former example, you see that I haue set downe the seuerall prices, whiche bee 30.36.42.45. and haue linked togither 30. with 45. and 36. with 42. The common price 40. I haue set on the lefte side, as before is declared, and the difference of it frõ euery

euery seuerall price, I haue set on the right hande, against that summe with the whiche it is linked. So the difference of 30. from 40. is 10. whiche I set against 45. ẏ he is linked withall, and the difference of 45. aboue 40 is 5, whiche I haue set against 30. So likewise, the difference of 42, aboue 40, is 2, that I haue set against 36. And the difference betweene 36 and 40, (whiche is 4) I haue set againste 42. Then I adde all those differences together, namely 5, 2, 4, and 10, and they make 21, whiche I make the first number in the Rule of three, and 6 li. whiche is the waight of the Scepter of Golde the seconde number, and the third number shall be euery particuler difference for euery seueral workinge. Then worke by the rule of three: sayinge if 21 (which is all the differences added togither) do giue me 6 pound waight, whiche is the waighte of the Scepter, what shall 5 giue, whiche is the first difference?

I multiply and diuide, and I finde 1 li.

li. waight $\frac{3}{7}$, so much must I haue of ye first price. Thē I do in like manner wt the rest, & I finde $\frac{4}{7}$ of a li. waight of the second price, 1 li. $\frac{1}{7}$ of ye third price: and 2 li. $\frac{6}{7}$ of the fourth; the whiche 4 summes beynge added together, doe make 6 li. which is the whole waight of the Scepter that I wold haue. And nowe to proue if ye prices doo agree, you shall do thus: First multiply this totall summe 6 by the common price 40, and it will make 240 crownes, whiche you shal keepe by it selfe. And afterwarde multiplye euery seuerall summe of waight by the price belonginge to the same waight, and if that summe doo agree with the first yt you kept by it self, thē is your worke well done, as heere 1 li. $\frac{3}{7}$, is ye waight of ye sort of Golde which is of 30 crownes price. Therefore multiply 30 by 1 li. $\frac{3}{7}$, and it maketh 42 crownes $\frac{6}{7}$, which you must set downe. Then multiply $\frac{4}{7}$ (whiche is the wayght of the seconde sorte of Golde) by 36 whiche is the price of ye same, and thereof commeth

20 crownes $\frac{4}{7}$: so againe 1 li. $\frac{1}{7}$, multiplied by 42 crownes, whiche is the thirde price, dothe make 48 crownes. And last of al 2 li. $\frac{6}{7}$, multiplyed by 45, maketh 128 crownes $\frac{4}{7}$. All these beynge added together, dothe make 240 crownes, agreable to ẏ former summe of 40, multiplyed by 6. And thus I may affirme that this worke is well done.

2. A Tauerner hathe foure sortes of wine, of foure seuerall prices, the first of 8 pence the Gallonde, the second of 10 pence the gallonde, the third of 15 pence and the fourth of 18 pence. And he will mixe all these sortes together, so that the Gallond shall be worth but 12 pence. I demaunde howe manye Gallonds he must take of euery sort? *Answere*: Firste suppose the punchen to holde some certaine measure, as to conteine 84 gallondes, and then the forme will be after this sorte, as you se hearcafter followinge.

12	8	3	
	10	6	
	15	4	
	18	2	
		15	

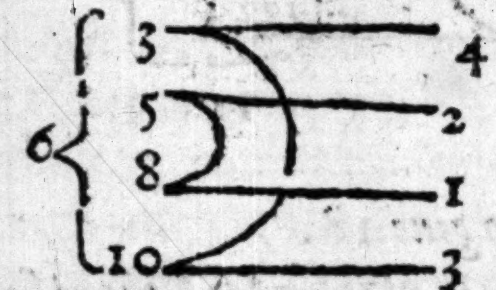
If 15 doo giue 18.

What will 3.	*geue?*	$16\frac{4}{5}$	*of the first.*
What will 6.	*They*	$33\frac{3}{5}$	*of the secõde*
What will 4.	*make*	$22\frac{2}{5}$	*of the third.*
What will 2.		$11\frac{1}{5}$	*of the fourth*
		84	

3. A mint maister hath 4 sortes of siluer Billion, of these finesse folowing: The first is of 3 ounces fine, the secõd of 5 ounces fine, the thirde of 8 ounces fine, and the fourthe of 10 ounces fine. And of all these 4 sorts, he would make another sort, that shoulde be but of 6 oun. fine. The questiõ is to know what portion he must take of euery of the said billions? *Answere.* Set down the particuler finesse, the one vnder ye other, namely 3, 5, 8, and 10, and set 6

whiche

whiche is the common finesse, before them towarde youre lefte hande, as heere you may see.



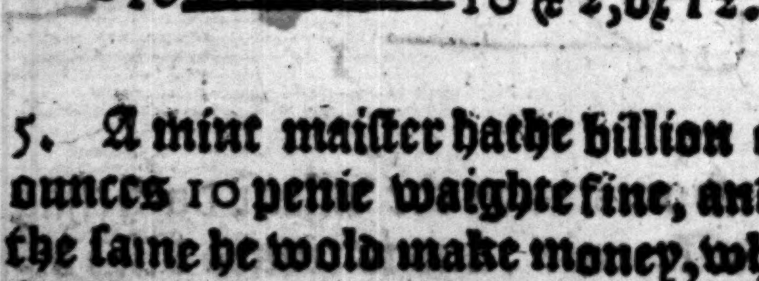
Then put the difference of 3 from 6, right against 10, and the difference of 6 from 10, which is 4, right against 3. Likewise ye differēce of 5 frō 6, whiche is 1, righte againste 8: & the difference of 6 from 8, which is 2, right againste 5. This done, you shall conclude, that for euery 4 pounde waight that he taketh of the billion of 3 ounces fine, he must take 2 li. of the billion of 5 ounces fine, and 1 li. waight of the billion of 8 ounces fine, and 3 li. waight of the which is of 10 ounces fine. Or els yf you please, adde 4, 2, 1, and 3 togither and they make 10, whiche shall be the denominator, of euery of the portions

that

that is to saye you shall take $\frac{4}{10}$ of the billion of 3 ounces fine $\frac{2}{10}$ of yͤ which is of 5 ounc. fine $\frac{1}{10}$ of yͤ of 8 ounces fine, and $\frac{3}{10}$ of that which is of 10 oũces fine. And so of all such like. And if you wolde make 60 li. waight of such a mixture, you must adde 4, 2, 1, and 3 togither, which maketh 10, and then worke by the rule of company sayinge if 10 li. giue 60 li. what will 4 geue? and so likewise what will 2 giue. &c. This forme may be varied, by combininge yͤ particuler valeurs after this maner as here you doe see, and as in the other example, it is plaine.

4. Sometimes the valeur doth chãg his difference, and is linked vnto diuers, for to represent the portion that is to be taken of euery thing, as by example

aunle. A merchant hath wheat of 2 s. 8 d. the bushel, Rie of 2 s, and barley of 16 d. the bushell, and hee will make a mixture of these sortes which shal stand him but in 22 pence the bushell. It is demaunded how muche he maye take of euerye sorte of the saide graine? *Answere*: Put the differences of 22 from 32 and, 24 right againste the 16 And likewise the difference of 16 frō 22 right againste 32 and againste 24. And you shall finde for 6 bushels ẏ he taketh of wheat, hee must take 6 bushels of Rie. & 12 bushels of Barley.



5. A mint maister hathe billion of 9 ounces 10 penie waighte fine, and of the same he wold make money, which shoulde be but of 6 ounc. fine, & therefore it behoueth him to melte copper

therewith

therewith, which is valued at 0 penie waighte of fine. The question is to know how much siluer and copper he muste mixe togither? After that you haue put downe 9 ounc. $\frac{1}{2}$ for the valeur of the siluer, and right vnder the same, 0 for the copper, you muste take the difference of 6 from 9 $\frac{1}{2}$ whiche is 3 $\frac{1}{2}$, and place the same summe righte against the 0, for to signify the portiō of copper yͭ he must take: And the difference of 0, from 6, is 6:

$$6\left\{\begin{array}{ll} 9\frac{1}{2} & 6 \text{ li. sil.} \\ 0 & 3 \text{ li. } \frac{1}{2} \text{ cop.} \end{array}\right.$$

the same you must sett right againste 9 $\frac{1}{2}$, whiche shall represent the portion of Siluer that he must take. And thus you see, that for 6 li. of Siluer that he taketh, he must take 3 li. $\frac{1}{2}$ of Copper, to make the saide money of 6 ounces fine.

And if hee had 3 sortes of Siluer, Billiō, that is to say, of 6 ounces fine: of 7 ounces fine, and of 9 ounces fine, and hee wolde make money thereof

which sholde be but of 5 ounces fine, it behoueth him to mixe copper therewith. And this forme folowinge doth shewe howe the same must be combined, and likewise how muche he must take of euery sorte.

5 { 6 — 5
7 — 5
9 — 5
0 — 1, 2, 4 all is 7.

6. Likewise, a Mint mayster hathe Billion of Golde, at 19 karetts fine, some at 22 karetts fine, some at 24 karetts, whiche is full fine without corruption, and hee will make coyne thereof, whiche shalbe of 23 karetts fine, it is demaunded howe muche he must take of euery sorte? *Answere*, make youre Alligation as this forme hereunder sheweth.

23 { 19 — 1
22 — 1
24 — 4, 1, all is 5.

More, the saide mayster hath Golde of 20 karetts $\frac{1}{2}$ fine, and of 22 karetts fine, and hee will allay the same to 18 karetts fine, And for to doo the same, it is conuenient for him to mixe siluer therewith, whiche is estemed at 0 karetts fine, but proceeding according to this Rule, hee shall finde that for 18 pound waight, or other porcions that he taketh of the 2 sortes of Billion of Golde, he must take 6 li. waight, and $\frac{1}{2}$ of Siluer, to Allay the same unto 18 karetts fine.

Note.

$$18 \begin{cases} 20\frac{1}{2} \text{ ——— } 18 \\ 22 \text{ ——— } 18 \\ 0 \text{ ——— } 2\frac{1}{2}, 4, \frac{1}{1} \text{ is } 6\frac{1}{2}. \end{cases}$$

7. Againe the saide Maister hath 100 pounde waight of Gold at 22 karetts fine, and 20 pound waighte at 19 karetts fine. The which he will allay to 20 karets fine. The question is whether he ought to mixe any siluer with the same, yea or no, and howe muche?

Answere, you must consider (by ye first part of the rule of Alligation) the alloy of the 100 li. and of the 20 li. beinge melted togither, & you shall find that the same is of 21 $\frac{1}{2}$ karets fine, & therefore for as muche as the same is yet of a better finesse then he woulde haue it, he muste therefore mixe siluer therewith, that is to say for 20 pound waight, or portions of gold, he muste take thereto 1 li. $\frac{1}{2}$ of siluer.

$$20\left\{\begin{array}{l} 21\frac{1}{2} \\ \hline 0 \end{array}\right. \begin{array}{l} \text{———} 20 \\ \text{———} \cdot 1\frac{1}{2}. \end{array}$$

8. If he had 1 li. waighte fine siluer of 12 ounces fine, I demaunde howe muche copper he muste mixe with the same, to allay it vnto 11 ounces $\frac{1}{4}$ fine, that is to saye, to 11 ounces 5 penie waight fine, make your Alligation as before is taught. Then diuide the porcion of Copper, by the porcion of fine, and you shall finde $\frac{3}{45}$, whiche beinge abbreuied, is $\frac{1}{15}$. And thus to euery li.

waight

waight of siluer, you muste take $\frac{1}{11}$ of a Li. of copper, and for euery 11 pound $\frac{1}{4}$ of siluer, you muste take $\frac{1}{4}$ of a Li. of copper. And so is to bee done with the same, in case that it were of anye other alloy.

9. A maister hath 1 Li. of fine Golde of 24 karetts fine the which he would allay to 22 karetts fine. The question is to know how muche siluer must be mixed with the same, that it may be of the finesse of 22 karetts before. *Ans.* take the difference of 22 to 24 whiche is 2. Then diuide 2 by 22 whiche you cannot, for they are $\frac{2}{22}$, but abbreuie them, and it is $\frac{1}{11}$. And so much siluer muste be mixed with 1 Li. waighte of fine golde that the same may be of 22 karetts fine.

10. A Goldsmith hath 1 Li. waighte of siluer billion of 7 ounces fine, it is demaunded how muche fine siluer he must put to the same, that being molten togither, it maye bee of 10 ounces

 fine

fine. *Answere*, make your alligation of 7, and 12 vnto 10. and then diuide ye porcion of the fine siluer, by the porcion of siluer billion and you shall finde 1 $\frac{1}{2}$: and thus to 1 li. waighte of 7 ounces fine, you muste take 1 li $\frac{1}{2}$ of fine siluer of 12 ounces fine to make the same of 10 ounces fine.

11. A Merchant hathe geuen order vnto his factor to employe him 83 li. 6 s. 8 d. sterling. in 5 sortes of spices, yt is to say in Nutmegs of 80 d. ye pound Cloues at 76 d. the pound, Sinamon at 52 d. the pound, Ginger at 34 d. the pounde, and pepper at 30 d. ye pound. But he hathe not appointed him the quantitie or porcion which he shoulde buy of euery sort, neither yet of all the sortes togither, the questiō is to know how much the factor must buy of euery sort to haue of each of thē like quantity. *Answere*, you must add 80, 76, 52, 34, and 30 togither, and they make 272. Then you must diuide 83 li. 6 s. 8 d. beinge reduced into pence, name-

ly 20000 d. by 272, & therof commeth 73 li. $\frac{9}{17}$. And so many poundes must he buy of euery sort of the saiid spices.

12. But in case he woulde not haue so many poundes of the one sorte, as he woulde haue of the other, then you must take another middell valeur, betwene the saide particulers, as for example, let the meane number be 50 d. Then reduce the said 83 li. 6 s. 8 d. into pence as the other prices are, & they doe make 20000 pence, the same you must diuide by 50 pence whiche is the meane or cōmon price, and therof will come 400 li. And so manye poundes must he haue of al the sortes togither, Then if you will know howe manye poundes he muste haue of euery sorte you muste set downe youre particuler prices, after the middell valeur, that is to saye after 50 d. as hereafter followeth: And then worke by the rule of company, and you shall finde.

	80	20
	76	16
50	52	16
	34	26 & 2, all is 28.
	30	30
		110

	20?	*Ans.*	$72\frac{8}{11}$
	16?	*Ans.*	$58\frac{2}{11}$
150 geue, 400 what	16?	*Ans.*	$58\frac{2}{11}$
	28?	*Ans.*	$101\frac{9}{11}$
	30?	*Ans.*	$109\frac{1}{11}$
			400

The 17. Chapter treateth of the *Rule of Falsehode, or false positions.*

The Rule of falsehode is so named, not for that it teacheth any deceite or falsehode, but that by fained numbers taken at all aduentures, it teacheth to finde out the trewe number that is demaunded. And this (of all the vulgar Rules which are in practise) is the most

most excellent: this Rule hathe twoo partes, the one is of one false position alone, ÿ other is of twoo positions, as hereafter shall appeare.

Those questions whiche are doon by false positions, haue their operations, in a maner like vnto that of the Rule of three: but only that in ÿ Rule of three, wee haue three numbers knowen, and heere in this rule, wee haue but 1 number that commeth in vse to worke by: vnto ÿ likenes whereof, we must deuise two other numbers, ÿ one multiplying, and the other dividinge as by example.

1. I haue delivered to a banker, a certaine summe of pounds in money, to haue of him by the yeare simply, 6 li. vpon the 100 li. And at the ende of 10 yeares, he paide me 500 li. for all, both principall and gaine. I demaũde howe much was the principall summe that I delivered him at the first? Here you see that there are divers termes: but the cheife to worke withall is 500 li.

li. whiche commeth of the other numbers, that is to say, of 10, and 100, for of them is composed or made ẏ tenor of the question, the practise whereof is thus.

Let vs fayne a number at pleasure, and with the same let vs make oure discourse, euen as though it were the principall summe that wee seeke for. As by Examply. Suppose that I deliuered him at the first 200 li. ẏ which were worthe to me in 10 yeares, 120 li. after the rate of 6 li. vpon the 100 li. Then 120 li. added with 200 li. do make but 320 li. and I must haue 500 li. Thus you see ẏ I haue three termes for the Rule of three: the one whiche shall conteyne the Question, the other twoo whiche I haue formed artificially, whiche are 200, and 320: in suche sorte, that 320, ought to haue suche proportion to 200, as 500 hathe vnto the number that I seeke: that is to say, vnto the trewe pricipall sume, then must I haue recourse vnto the Rule of three after this sorte, sayinge.

If 320 li. become of 200 li. of howe muche shall come 500 li. I doo multiply 500 by 200, and they are 10000 the whiche I must diuide by 320 li. & thereof commeth 312 li. $\frac{1}{2}$, whiche is the summe that I deliuered at the first. And thus, this rule hathe some cõgruence with the doble rule of three.

2. I haue a Cestren with 3 vnequall cockes conteyning 60 pipes of water: And if the greateste cocke be opened, ỹ water will voide cleane in 1 hower, at ỹ second it will auoid in 2 howers, And at the thirde it will require 3 howers, nowe I demaunde in what space it will auoide, all the cockes beynge set open? *Answere:* Suppose ỹ it will anoyde in halfe an houre: that is to say, in 30 minutes. Then must there auoide at the firste cocke the $\frac{1}{2}$, whiche is 30 pipes: and by the second cocke the $\frac{1}{4}$, whiche is 15 pipes, & by the third cocke the $\frac{1}{6}$, that is 10 pipes: all the whiche summes beynge added together, doo make 55 pipes: but it

shoulde

should be 60 pipes. Therefore say by the rule of three, if 55 pipes doo voide in 30 minutes: in how many minutes will 60 pipes voide? multiply and diuide and you shall find 32 minuts $\frac{40}{55}$ the which $\frac{40}{55}$ beinge abbreuied are $\frac{8}{11}$ of a minute, and in that space will the water voide if all the cockes be set open.

Of the rule of two false positions.

A Rule. The summe of this Rule of twoo false positions is thus, when any question is proponed appertayninge to this rule. First you must ymagine any number at youre pleasure, whiche you shall name the first position, and with ye same shall you worke in steede of the trewe number, as the question dothe importe, and if you see that you haue missed of the trewe number that you doo seeke: Then is the last number of the worke, either to greate or to little, the whiche number, you shall note with the signe of more or lesse

for that is the first error in the which, you haue fayled, the whiche signes of more, & lesse, shalbe noted with these figures $+$, $-$, This figure $+$, betokeneth more: and this plaine line $-$, signifieth lesse: that is to say the one signifieth to muche, and the other to little: then you must begin agayne, and take another nūber, which shalbe the seconde position, and worke by the question as before, yf you haue fayled againe, note the excesse or wāt, for that is the seconde error. Then shall you multiply the first position by ẏ second error crossewise, and againe the second position by the firste error, (and this must alwayes bee obserued) and you must keepe the two productes: then if the signes be bothe like, that is to say, either bothe to muche, or bothe to little, you shall abate the lesser producte from the greater, & likewise, you shall subtract the lesser error from the greater, and by the remayne of those errors, you shal diuide the residue of the products, the quotiēt shalbe the trewe

number

number that you seeke. But if the two signes be unlike, that is to say the one to muche, and the other to little, then you shall adde those productes together, and likewise you must adde both the errors together, and by the summe of those errors, diuide the totall summe of both the products: ye quotient shal be the trewe nūber that you do seeke, and this is the whole rule, as by these examples folowinge, it will apeare more plaine.

Example.

3. A man lyinge at the poyncte of death saide yt he had in a certaine Coffer 100 Duckets, the which he bequethed to thre of his freindes by him named after this sorte. The firste muste haue a certaine portion. The seconde must haue twise so manye as the firste abating 8 Duckets: and ye thirde must haue thre times so manye as the firste lesse by 15 Duckets. Now I demaūd how manye euery of them muste haue

Ans-

Answere: first I do imagine ẏ the first man had 30 Duckets, then by the order of the question, the second shoulde haue 52, and the third 75. These three summes beinge added togither doo make 157: & I shoulde haue but 100 so that this first errour is to muche by 57, then I note apart, the first positiō 30, wͭ his error 57 to muche after this sort 30, ✝ 57. Therefore I prosecute my worke, and I suppose that the first had 24, then by the order of the question, the second shoulde haue 40, and the third 57: these three summes being added togither, do make 121, and I muste haue but 100, so the seconde error is to muche by 21. Therefore I note 24, ✝ 21, vnder ẏ 30, ✝ 57, which was my first position whiche ẏ error as you may se in ẏ worke on the nexte side folowinge.

Then I multiply crossewaies, 30 (whiche is the firste position) by 21 which is the seconde error, and thereof commeth 630. Likewise I multiply 24, (which is the second position)

 by

by 57 which is the firste error, and I finde 1368: then bicause the signes of the errors are bothe like: that is to saye, bothe to muche, I must therefore subtract 630, frõ 1368, and there wilremain 738 which is the diuidende: agayne I muste subtract ye lesser error from the greater, that is to say, 21, out of 57, & there will remaine 36, whiche shalbe my diuisor. This done I diuide 738, by 36, and the quotient will be 20, $\frac{1}{2}$.

.630.

30. + 57.

24. + 21.

1368. 36.

630.

738.

20. $\frac{1}{2}$.
33.
46. $\frac{1}{2}$.

100.

$\cancel{2}$ 1.
$\cancel{7}\,\cancel{3}$ 8.
$\cancel{3}\,\cancel{6}\,\cancel{6}$. (20. $\frac{1}{2}$.
$\cancel{3}$

The

The whiche 20 $\frac{1}{2}$, is the iust number of the Duckets that the first man had for his parte, so consequently the se=conde man had 33 Duckets, and the thirde 46 $\frac{1}{2}$, as by the workinge afore may appeare.

The like number will also appeare, in case the errors were bothe to little, as in makinge the two positions by 18. and 20, & you shall finde that ye two errors wilbe both to little, the firste will bee to little by 15. and the seconde to little by 3, as by perusinge this worke, you shall well perceaue.

54.
18. — 15.

20. — 3.
300. 12.
54.
246. | 246 (20 $\frac{1}{2}$.
12
1

Againe if one of the errors were to

muche, and the other to litle, yet you shall haue the true number, as before. As if the two positions were 24, & 20 you shall finde that the firste error will be 21 to muche, and the seconde will be 3 to litle. Therefore multiplye 24 by 3 crossewaies, thereof commeth 72.

Likewise multiply 20 by 21, ẏe product will be 420. These two summes 72 and 420, you shall adde together, bycause the signes of ẏe errors bee vnlike, and they make 492, ẏe which shall be your diuidende, & againe, adde the lesser error 3, with ẏe greater error 21, and they make 24, for your diuisor,

72.
24. — 21.
20 — 3.
420. 24.
72.
492.

1
492
244
2.

then

then diuide 492 by 24. the quotient will bee $20\frac{1}{2}$: as before dothe playnly apeare.

And now bicause you shall not forget this parte of the rule, learne this breife remembraunce folowing.

The signes both like, subtractiō do require.
And vnlike signes, adition will desire.

The meaninge whereof is thus, if both the errors haue like signes, then must the diuidende and the diuisor be made by subtraction, as is taught before, and if those signes be vnlike, then must you by addition gather the diuidende, and the diuisor, as I haue done in this last example.

Another Example.

4. A man hath two siluer cuppes of vnequall waight, hauinge to thē both but one couer, the waight wherof is 5 ounces, if the couer be put to the lesser cuppe, it will be in double proportion

vnto the waighte of the greater, and the couer beynge put to the greater cuppe, it will be in triple proportion, vnto the waight of the lesser. I demaunde what was the waight of euery cuppe? *Answere.* Suppose that the lesser cuppe did weighe 7 ounces, then with the couer it must waighe 12 ounces, and this weight shoulde bee in double proportion vnto the greater, therefore the greater must weygh but 6 ounces, adde vnto it 5 oũces for the couer, all wil be 11 ounces, but it shoulde be 21, for to haue it in triple proportiõ, vnto 7, which represẽteth the waight of ẏ lesser cuppe: So that this

105.

7. —— 10.

9. —— 15.

90. . 5.

105.

90 | ~~15~~ (3 ounces.

15 | ~~5~~

this first error is to little by 10, which you shall note after 7 in this sorte, 7, —— 10.

After you shall suppose some other number, as 9, and make the like work as before, so you shall finde 15 to litle for the seconde error, whiche you shall put behind 9 with the signe lesse thus —— 15, & thẽ worke with the rest as aboue is said, and you shall finde that the lesser cuppe waighed three oũces, and consequentlye the greater foure ounces.

5. One man demaunded of another in a morning, what a clocke it was, ẏ other made him this answere, if you you doe adde (saithe he) the $\frac{1}{4}$ of the howers which be past since midnight with the $\frac{2}{3}$ of the howers which are to come untill noone, you shall haue the iuste hower, that is to saye, you shall know what a clocke it was. *Answere.* Suppose that it was 4 a clocke in the morninge, so shoulde there remaine 8 untill noone, then I take the $\frac{1}{4}$ of 4

which is 1, and the $\frac{2}{3}$ of 8 which is $5\frac{1}{3}$ and I adde them togither, so I finde $6\frac{1}{3}$, and I supposed but 4, therfore this first error is to much by $2\frac{1}{3}$, whiche I note after my position, thus $4 + 2\frac{1}{3}$ then againe I suppose an other number, that is to say 9. so should remaine but 3 howres untill none. I take the $\frac{1}{4}$ of 9 and the $\frac{2}{3}$ of 3, which is $2\frac{1}{4}$ & 2: these I adde togither, and they make $4\frac{1}{4}$: but I supposed that it was 9 therfore the seconde error is $4\frac{3}{4}$ to litle, whiche I note behinde my position thus. $9 - 4\frac{3}{4}$.

And then I multiply crosse wise, as before is taught, & bycause the signes of ye errors are unlike, that is to saye, the one to muche, & the other to little, therfore in this worke I must adde the products, and they

19.

$4. + 2\frac{1}{3}.$

$9. - 4.\frac{3}{4}.$

21. $7.\frac{1}{12}.$

19.

40.

they wil be 40. Likewise I must adde the errors, and they be $7\frac{1}{12}$. Then I diuide 40 by $7\frac{1}{12}$, & thereof commeth 5 houres $\frac{11}{17}$, and that houre it was in the morninge.

The 15. Chapter treateth of diuers *questions extraordinarie, euery one of them containinge a general rule for such lyke examples.*

1 FIue men deuising of their ages The first said to the others, he ỹ was 120 yeres of age: The secōd said if my yeares were doubled, then shold I haue so many yeares more then the first man, as the first hathe nowe more then I haue: The thirde saide in like maner, if my yeres were tripled. The fourth said if my yeares were quadrupled, that is to saye Multiplyed by 4: The fiueth said that if his yeres were quintupled, that is to saye multiplied by 5, that they shoulde each of thē haue so many yeares more then the first mā

as he hath now more then euerye one of thē. The question is to know, how olde euery of the other 4 men were? *Answere*, you must take the numbers whiche are neerest collaterals, in naturall order vnto 2, 3, 4, and 5 by reason of duplinge, triplinge, &c. And the greater of euery of the saide numbers collaterals, must be your Denominator, to the lesser number. As thus. the nexte collaterall numbers vnto 2. are 1 & 3. which is $\frac{1}{3}$. Likewise ẏ next collateral nūbers to 3 are 2, and 4 which is $\frac{2}{4}$. And so for 4, are 3 & 5 which are $\frac{3}{5}$, and for 5 are 4, and 6 whiche bee $\frac{4}{6}$. Then if you will knowe the seconde mans age, you must adde vnto 120, ẏᵉ $\frac{1}{3}$ of it selfe which is 40, all is 160, the same you must diuide by 2, and thereof cōmeth 80 yeares, and so olde was the second man. And for to know the age of the thirde man: you must adde vnto 120 his owne $\frac{2}{4}$, that is to saye his $\frac{1}{2}$, whiche is 60: And they make 180. The saide summe you muste diuide by 3, & thereof cōmeth 60 yeares

for

for the thirde mans age. And after the saine maner, you shall finde that the fourth man had 48 yeares, and the fiueth had 40 yeares. The proofe is very easy.

2. A man hauing his eye sight somewhat altered, began to to tell and recken a certaine number of birdes to be in all 18, his Companion that had a cleerer sight, beholding well ẏ birdes. Answered him that there were not 18. But said he, if there were twise so many more as there are, there sholde be as many more aboue 18, as there be now lesse then 18. The question is to knowe, howe many birdes there were in all: *Answere*, you must adde vnto 18 his $\frac{2}{4}$, that is to say his $\frac{1}{2}$, and thereof will come 27, the whiche you shal diuide by 3, and thereof commeth 9. And so many birdes there were in all.

3. A Draper hath bought 24 sorting clothes, and he hath solde 100 poūdes

worthe

worthe of the same clothes, vpon the which he hathe gained, as muche as 1 clothe did coste him I demaunde, what 1 of the saide clothes did coste him? *Answere*, you must adde 1 vnto 24, and they make 25, Then diuide 100 by 25, and thereof will come 4 li. and so muche did one clothe cost him.

4. A mayde carried egges vnto the market, and it happened a merry fellowe to meete her, who began to iest with her in suche sorte, that hee ouerthrew her Basket, and brake all her egges, the mayde beinge muche displeased with him for breakinge of the same, sayd very earnestly vnto him, ye he should pay for them, the man considering with himselfe, that by his folly they were broken, answered ye mayde, that hee wolde pay her for them, and therefore hee demaunded of her what nūber she had: The silly poore wenche that coulde not well reckon, saide vnto him, that shee coulde not well tell him, but sayde she, when I did put the into

into my Basket by 2, and by 2, there remayned 1 egge: and when I counted them by 3 and by 3, there remayned 1: and when I did reckē them by 4 and by 4, there remayned still 1: but when I did counte them by 5 and by 5, there remained none. The question is to knowe, howe many egges the mayde had in all? *Answere*, for to doe this, and all suche like questions, you must multiply 2, 3 & 4 together: sayinge, 2 times 3 make 6, and 6 times 4 make 24, vnto this number you must adde 1, and they make 25. And so many egges she had in all. But yf she had had a greater number of eggs, that she might haue counted them till she came to 7 and 7, after ẏ same mãner as she did, til she came to 5 and 5: you must multiply these numbers 2, 3, 4, 5 and 6 the one by the other, and thereof will come 720, vnto ẏ whiche adde 1, and they make 721. And so many eggs she should haue had, if she had counted them by 7 and 7.

5. Againe,

5. Againe, if she had saide, that when she counted her eggs by 2, and 2 there remained 1: and by 3, and 3 there remained 2, and by 4 and 4 there remained 3: and by 5 and 5, there remained nothinge. The question is to know, howe many egges she shoulde haue had? *Answere*, you muste finde a number the lest that you can possible, which may be diuided by 2, by 3, and by 4, that is to saye 12, is the nearest number, diuide the same by 5, & there remaineth 2. This beinge done you must finde 2 numbers the leste that is possible, which may be diuided by 5, & by 2, in such sort, that the nūber which is diuided by 2 may excede (the other that is diuided by 5) onely by 1, and those 2 nūbers are 10, and 6, for if you diuide 6 by 2 your quotient will be 3 and 10 diuided by 5 bringeth but 2: then cōsider that 6 conteineth 3 times 2. And therefore you muste multiplye 12 by 3, and they make 36, from the which you muste subtract 1, and there will remaine 35, which is the number

that

that is required to be founde.

6. And if she had counted them after the same manner vnto 7, and that there had remained nothing, then you knowe that 60 is the neerest number that may be diuided by 2, 3, 4, & 5, 6, the which 60 being diuided by 7, there will remaine 4, and therfore you must finde two numbers the leste that may be, that can be diuided by 4, and 7, in such sorte, that that number which is diuided by 4, may exceede the other number (by 1,) that is diuided by 7, the which 2 numbers are 7, and 8, for if you diuide 8 by 4 your quotient wil be 2. And diuidinge 7 by 7, your quotient will be 1, and therfore forbicause that 8 containeth 2 times 4, you must multiply 60 by 2, and thereof cõmeth 120, from the which number you shal subtract 1, and the residue whiche are 119, is the number that is required.

7. A theefe enteringe into a garden, did steale from thence a certaine num-

ber of apples: And at his comminge furth, he did mete with 3 men, one after another, who threatened to accuse him: and for to appease them, he gaue vnto the first, the $\frac{1}{2}$ of all his apples, who receaued the same with thankes; but he retorned him 12 of them backe againe. Then he gaue vnto the second the $\frac{1}{2}$ of them that he had remaininge who receaued ye same, but he gaue him backe againe 7 apples: and so he gaue vnto the thirde man, the $\frac{1}{2}$ of the residue, who retourned him 4. And in the ende he had still remaining 20 apples The question is to know how manye apples he gathered in the saide garden? *Answere*, for to do this, you shall subtract 4 from 20, and there will remaine 16, the same you shall double, & they make 32: frō the which you must abate 7, and ther will remaine 25: the same you shall double, and they make 50: from the which you shal subtract 12, and there will remaine 38: where of the double whiche is 76 doth shew the number of apples that he gathered.

red. This and such like questions are easy to be done in goinge backwards from the ende of the question untill you come to the beginninge thereof. But if he had given the $\frac{1}{3}$ unto one of them, the $\frac{1}{2}$ unto another, and $\frac{1}{4}$ unto the last, or any other, all the same may be done by the converse rule that is to say beginninge at the ende of the question, till you come to the beginninge as before is saide.

8. A merchant did ride unto thre severall fayres: at the firste he doubled his money and spent 10 crownes, at the secōd fayre he did also double his money, and spent 10 crownes: And likewise at ỹ third fayre, he did double his money and spent 10 crownes, and in the ende, he founde that he had remaining but 2 crownes. The questiō is to knowe how manye crownes he had at the first? *Ans.* for to do this, you muste adde unto 10 crownes, the 2 crownes whiche he had remaininge, and they make 12, whereof you shall

take the ½ whiche is 6: againe adde 6 vnto 10, and they make 16, whereof you shall take the ½, which is 8: finally, you shall adde 8 vnto 10, and they make 18, whereof you must take the ½ which is 9: and so he had 9 crownes at the firste.

9. A Burgeois woulde distribute a certeine summe of pence vnto diuers poore men equallye: but after that he had counted howe many they were in number: he perceaued ỹ if he shoulde geue vnto euery mã 6 pence, he should want 14 pence: But if he should giue euery man 5 pence the pece, he should haue 9 pence remaining. The questiõ is to knowe the number of the poore men: *Answere*, for to do this, and such like questions, you muste haue in remembraunce this principle, more frõ more, or lesse from lesse. &c. whiche is sett furth in 2 verses in the Rule of false positiõs, that is to say you muste adde the lesse with the more. Namely 14 with 9, and they make 23: and diuide

uide the same summe by the differēce which is of 5 from 6, that is 1. And therefore you must diuide 23 by 1, but 1 dothe neither multiplye nor diuide therefore you maye conclude and saye that there were 23 poore men.

10. And if he should geue to euerye man 5 pence, he should haue 19 pence remaininge, and giuinge euerye man 7 pence, he should haue 3 pence ouer: In this case you must abate more frō more, that is to saye 3 from 19, and ŷ rest which is 16 you must diuide by 2 which is the difference of 5 frō 7: and the quotient whiche is 8, dothe shew you the number of the poore men, and likewise if that he had had both wāts, that is if both the numbers had bene to litell, you muste haue donne with them as you did with the others that were both more.

11. A man hathe geuen vnto 20 worke folke 20 s. that is to saye vnto men, wemen, and boyes: vnto men

he gaue 20 pence a peece, vnto weo-
mẽ 15 pence, and vnto boyes he gaue
8 pence. The question is to knowe
how many men? how many weomen?
& how many boyes? there were in all?
Answere, First you must take the dif-
ference of 8 from 15, and also frõ 20:
and you shall haue 7 for the difference
of the women: & 12 for that of ẏ men:
this done, you may suppose that there
were 20 boyes, the whiche at 8 pence
the peece maketh 160: the which you
must abate from 20 s. beinge reduced
into pence, that is from 240 pence: &
there will remaine 80 pence, ẏ whiche
80 you shall diuide into 2 such partes
that ẏ one may be diuided by 7, and ẏ
other by 12, and that nothinge maye
remaine after the diuisions are made.
The which 2 numbers are 56, and 24
For 56 beinge diuided by 7, bringeth
into the quotient 8, and 24 beinge di-
uided by 12, will bringe in the quoti-
ent 2: which sheweth that there was
8 weomen, 2 men. And the rest of the
20, which are 10, were boyes, so ther

were

were 8 weomen, 2 mē, and 10 boyes. Some men do cal this rule, ẏ virgins Rule.

The 16 Chapter treateth of sportes *and pastime, done by number.*

If you would know the number that anye man doth thinke or imagine in his minde, as though you could devine.

Bydde him triple the same number, then of the product let him take the ½ if the number be even, or els the greater halfe, if the same be odde, then bidd him triple againe the saide ½: after say to him that he shall put away if he cā 36, 27, or 9. from the last number beinge tripled: that is to saye, cause him subtelly to put away 9 as many times as is possible and kepe the number secreatly: and when he can no more take away 9: then to know if that yet ther remaine any number, bid him abate 3

2, or 1, if hee cā: this done, see how many times 9 you haue caused him to abate, for the whiche keepe you in minde so many times 2, and if that you know ẏ he had any thinge remaininge besides the nines, the same shall also note vnto you 1.

Example.

Suppose that he thought 6 which beinge tripled is 18, wherof the $\frac{1}{2}$ is 9 the triple of that is 27: now cause him to abate 18, or 9, or 27: and againe 9, but then he will saye vnto you that he cannot, bid him then abate 3, or 2 or 1 he wil say also ẏ he cannot: wherefore consideringe that you haue made him to abate three times 9 iustly, you shall tell him that he thought 6, for 3 times 2 maketh 6. If he had thoughte 5 the triple thereof is 15, wherof the greater $\frac{1}{2}$ is 8, the triple of that maketh 24 whiche conteineth twoo times 9. they are worth 4, and the remaine signifieth 1, the which added togither make 5 which is the nūber that he thought.

2. If in any companye, one of them hath a ringe vpon his finger, and you would know by maner of deuininge, who hath the same & vpon what finger and what ioynt; cause the persons to sit downe in order, & kepe likewise an order of their fingers: then seperat your selfe from them in some certaine place, and say vnto one of the lookers on, that he double the number (markinge well in your minde the order) of him that hath the ringe: and vnto the double bidde him adde 5, and then cause him to multiplye this addition by 5, and vnto the producte bidde him adde the number of the finger of the person whiche hathe the ringe: Suppose that the same laste summe did amount to 89, then afterwarde saye to him that he put after the same last nūber towarde his righte hande a figure signifiyng vpon which of the ioyntes he hath the ringe, as if it be vpon the third ioynt, let him put 3 after 89, and it wil be 893, this done, you shall aske

him what number he kepeth, from the which you shall abate 250, & you shall haue thre figures remaininge at the least. The first towarde your left hãde shall signify the number of the person which hath the ringe. The seconde or middle figure shall represent the number of the finger. And the laste fygure toward your right hande, shall betoken the number of the ioynt. As if the number which he did keepe were 883 from that you shall abate 250, & ther wil remaine 643, which do note vnto you that the sixt person hath the ring vppon the fourthe finger, and vppon his thirde ioynt.

But note that when you haue made your subtractiõ, if there do remaine a cipher in the place of tennes, that is to say in the seconde place, you must thẽ abate 1 from that figure which is in ye place of hundreds, that is to say from the figure whiche is nexte youre lefte hande, and yt shalbe worth 10 tenthes, signifying the tenth finger: as if there shoulde remayne 703, you must saye

that

that the sixt person (vpon his tenthe finger, and vpon his third ioynt) hath the ringe.

3. And after the same maner, if a mã do cast three dice, you may knowe the pointes of euery one of them, for if you do cause him to duble the pointes of one die, and vnto the duble to adde 5, and the same summe to multiply by 5, & vnto the product adde the poincts of one of the other dice, and behinde ẏ number towarde the right hande, to put the figure whiche signifieth the pointes of the last die, and then shall you aske him what nũber he kepeth, from the whiche abate 250, and there will remaine 3 figures, which do note vnto you the poincts of euery die.

4. Likewise, if 3 of youre companions, to say, Peter, James, and John woulde (in youre absence) gyue themselfes euery one a cõtrary name: as for example: Peter would be called a Kinge, James a Duke, and John a Countie: And you wold deuine which of them is called a Kinge, whiche the

Duke

Duke, and whiche the Countie. Take 24 stones, or other peeces whatsoeuer and giue vnto Peter 1, vnto James 2 and vnto Jhon 3, or otherwise. But marke well vnto whiche of them you haue giuen 1. vnto whiche 2, and vnto whome 3. Then leauinge the 18 stones (before them) that are remayninge, you shal absent your selfe from their sight, or else turne your facefrom them, saying thus vnto them, whosoeuer nameth himselfe a King: for euery stone that J gaue him, let him take 1 of the residue, and hee that nameth him selfe a Duke, for euery stone that J gaue him let him take 2 of them that remaine, and he that calleth himselfe a Countie, for euery stone that J gaue him, let him take 4: this beynge doone aproche neere them, and marke howe many stones are remaining: & knowe this, that there can not remaine any other number, but one of these sixe, 1, 2, 3, 5, 6, 7, for ye whiche sixe numbers we haue chosen to euery of them a seuerall name, whiche are these: *Angeli*,

Beati

Beati, *Taliter*, *Messias*, *Israel*, *Pietas*: eche of them cõtaining three Vowels, *a*, *e*, *i*, whiche doo shewe the names by order: That is to saye, the vowell *a*, sheweth whiche is the King, the vowel *e*, telleth whiche is the Duke, and the vowell *i*, sheweth whiche is the County: in folowinge yͤ order how, and to whome you haue gyuen one stone to whome 2, & to which 3, then if ther do remaine but one stone, the first name *Angeli*, (by these three vowels a, e, i.) sheweth that Peter is yͤ king, James the Duke, and John the countie. And if there doe remaine 2 stones, yͤ second name *Beati*, shall shew you by these 3 vowels e, a, i, that Peter is the Duke James the Kinge, and John the coũtie. And so of yͤ other as by this table doth plainely appeare.

1	2	1	2	3	3
2	1	3	3	1	2
3	3	2	1	2	1
a	e	a	e	i	i
e	a	i	i	a	e
i	i	e	a	e	a
1	2	3	5	6	7
A	*B*	*T*	*M*	*I*	*P*

FINIS.

The agrement of the measures, and *waightes, of divers countries, the one with the other, beinge reduced to an equallity: and drawen into Tables, as followeth.*

London,

100 elles at Londō do make, at.

- Andwarpe, ———— 166.$\frac{2}{3}$.
- Nuremberg, ——— 174.$\frac{1}{6}$.
- Franck. Liebsig, & Preslaw, 208.$\frac{1}{3}$.
- Dantzicke, ——— -- 138.$\frac{1}{3}$.
- Vienne in Austri. 145.
- Lyons in fraunce. 101.$\frac{2}{3}$.aulnes.
- Parris in fraunce. 095.
- Rouan in Norm. 086.$\frac{2}{3}$.
- Lishburne, ——— 100.vares.
- Sivell & other places in spay. 135.
- The Isles of Madere, 103.$\frac{1}{3}$.
- Venice, ———— 180.braces.
- Lucques. ——— 200.braces.
- Florence, ——— 204.$\frac{1}{6}$.braces.
- Millan, ——— 230.
- Geanes. ——— 480.$\frac{5}{6}$.paulmes.

The like agreement hathe 125 yardes, unto the measures aforesaide.

The agrement of the measure at *Andwarp withe the measures at other places.*

Andwarpe.

100 elles at Andwarpe do make, at.

London, yardes	75, & 60 elles.	
Nuremberge,	$104\frac{1}{2}$.	
Franckeford, &c.	125.	
Dantzicke,	83.	
Vienne &c.	87.	
Lions,	60, aulnes.	
Parris,	57.	
Rouane,	52.	
Lishborne,	60, varies.	
Siuell, &c.	81.	
The Isles. &c.	62.	
Venice,	108 braces.	
Lucques,	120.	
Florence,	$122\frac{1}{2}$.	
Millan.	138	
Geanes,	$288\frac{1}{2}$ paulmes.	

The agrement of the measure at Nü-*remberge with the measures at other places.*

Nuremberge.

100 elles at Nurẽberge, do make at	London, ————	57. $\frac{2}{5}$. ells.
	Andwarpe, ————	95. $\frac{3}{5}$.
	Franckforde, &c. ———	119. $\frac{3}{5}$.
	Dantzicke, ————	79. $\frac{1}{2}$.
	Vienne in Austrice, —	83. $\frac{1}{4}$.
	Lyons, ————	58. $\frac{1}{3}$. aulnes
	Parris, ————	54. $\frac{1}{2}$.
	Rouan, ————	49. $\frac{1}{4}$.
	Lishburne, ————	57. $\frac{2}{5}$. vares.
	Synell, &c. ————	77. $\frac{1}{2}$.
	The Isles of madere,	58. $\frac{1}{3}$.
	Venice, ————	103. $\frac{1}{3}$. braces.
	Lucques, ————	114. $\frac{4}{5}$.
	Florence, ————	117. $\frac{1}{5}$.
	Myllan, ————	132.
	Geanes, ————	276. paulmes

The agrement of the measure at *Frankeford, &c.* with the measures at other places.

Franckford, &c.

100 elles at Francforde, &c. doo make at

- London, 48. elles.
- Andwarpe, 80.
- Nuremberge, 83. $\frac{3}{5}$.
- Dantzicke, 66. $\frac{2}{5}$.
- Vienne in Austrice, 69. $\frac{3}{5}$.
- Lyons, 58. $\frac{4}{5}$. aulnes.
- Parris, 45. $\frac{3}{5}$.
- Rouan, 41. $\frac{3}{5}$.
- Lishburne, 48. vares.
- Syuell, 64. $\frac{4}{5}$.
- The Isles of madere, 49. $\frac{2}{5}$.
- Venice, 86. $\frac{2}{5}$. braces.
- Lucques. 96.
- Florence, 98.
- Millan, 110. $\frac{2}{5}$.
- Geanes, 230. $\frac{4}{5}$. paulmes.

The agrement of the measure at *Dantzicke*, with the measures at other places.

Dantzicke.

100 elles at dãtzike doe make at.	London,	72 $\frac{1}{4}$ elles.
	Andwarpe	120 $\frac{1}{2}$.
	Nuremberge	125 $\frac{7}{8}$.
	Franckeford,	150 $\frac{5}{8}$.
	Vienne &c.	107 $\frac{1}{2}$.
	Lions	73 $\frac{1}{2}$ aulnes.
	Parris	68 $\frac{5}{8}$.
	Rouan	62 $\frac{5}{8}$,
	Lishborne	72 $\frac{1}{4}$ vares.
	Siuell, &c.	97 $\frac{1}{2}$.
	The Isles &c.	74 $\frac{5}{8}$.
	Venice,	130, braces.
	Lucques,	144. $\frac{1}{2}$.
	Florence,	147. $\frac{1}{2}$.
	Myllan.	166. $\frac{1}{4}$.
	Geanes.	347. $\frac{1}{2}$. paulmes.

The agrement of the measure at *Vienne, with the measures at other places.*

Vienne in Austrice.

100 elles at vienne doe make at

London,	68. $\frac{9}{10}$. ells.
Andwarpe,	114. $\frac{9}{10}$.
Nuremberg,	120.
Franckford, &c.	143. $\frac{5}{8}$.
Dantzicke,	95. $\frac{3}{8}$.
Lyons,	70. $\frac{1}{10}$. aulnes.
Parris,	65. $\frac{1}{2}$.
Rouan,	59. $\frac{3}{4}$.
Lishburne,	68. $\frac{9}{10}$. vares.
Siuell, &c.	93. $\frac{1}{10}$.
The Isles, &c.	71. $\frac{1}{4}$.
Venice,	124. $\frac{1}{8}$. braces.
Lucques,	137. $\frac{9}{10}$.
Florence,	140. $\frac{4}{5}$.
Millan,	158. $\frac{3}{5}$.
Geanes,	331. $\frac{2}{5}$. paulmes.

The agrement of the measure at *Lyons, agreing with the measures at other places.*

Lyons.

100 aulnes at Lions dooe make, at

London,	98.$\frac{1}{3}$.	elles.
Andwarpe,	163.$\frac{7}{8}$.	
Nuremberge,	171.$\frac{1}{4}$.	
Franckford, &c.	204.$\frac{5}{6}$.	
Dantzicke,	136.	
Vienne,	142.$\frac{1}{2}$.	
Parris,	93.$\frac{2}{5}$,	aulnes.
Rouan,	85.$\frac{1}{4}$.	
Lishburne,	98.$\frac{1}{3}$.	vares.
Syuell, &c.	132.$\frac{3}{4}$.	
The Isles, &c.	101.$\frac{3}{5}$.	
Venice,	177.	braces.
Lucques,	196.$\frac{2}{3}$,	
Florence,	200.$\frac{3}{4}$.	
Millan,	226.$\frac{1}{5}$.	
Geanes,	472.$\frac{7}{8}$.	paulmes.

The agrement of the measure at *Parris, with the measures at other places.*

Parris.

100 aulnes at Parris do make at	London,	105.$\frac{3}{4}$ elles.
	Andwarpe,	175.$\frac{2}{5}$.
	Nuremberge,	183.$\frac{1}{3}$.
	Franckford, &c.	219 $\frac{1}{4}$.
	Dantzicke,	145.$\frac{3}{5}$.
	Vienne,	152.$\frac{3}{5}$.
	Lions,	107.aulnes.
	Rouan,	91.$\frac{1}{5}$.
	Lishburne:	105.$\frac{1}{4}$.vares.
	Siuell.&c.	142
	The Isles,&c.	108.$\frac{3}{4}$.
	Venice,	189.$\frac{2}{5}$.braces.
	Lucques,	210.$\frac{1}{2}$.
	Florence,	214.$\frac{7}{8}$.
	Millan,	242.
	Geanes,	506.$\frac{1}{8}$ paulmes

The agrement of the measure at Rouan with the measures at other places.

Rouan.

100 aulnes at rouã doone make at

London,	$115\frac{1}{8}$	elles.
Andwarpe	$192\frac{1}{4}$.	
Nuremberge,	$200\frac{7}{8}$.	
Franckford &c.	$240\frac{3}{8}$.	
Dantzicke	$159\frac{3}{5}$.	
Vienne	$167\frac{1}{4}$,	
Lyons,	$117\frac{1}{4}$	aulnes.
Parris,	$109\frac{3}{5}$.	
Lishburne	$115\frac{3}{8}$	vares.
Syuell,	$155\frac{3}{4}$.	
The Isles &c.	$119\frac{1}{5}$.	
Venice,	$207\frac{2}{3}$	.braces.
Lucques	$230\frac{3}{4}$.	
Florence,	$235\frac{1}{2}$	
Millan,	$265\frac{3}{8}$.	
Geanes,	$554\frac{4}{5}$	paulmes.

The agrement of the measure at *Lishburne, with the measures at other places.*

Lishburne.

100 vares at Lishe=burne doe make, at.	London,	100. elles.
	Andwarpe,	166. $\frac{2}{3}$.
	Nuremberge,	174. $\frac{1}{6}$.
	Franckeford, &c.	208. $\frac{1}{3}$.
	Dantzicke,	138. $\frac{1}{3}$
	Vienne.	145.
	Lions,	101. $\frac{2}{3}$. aulnes.
	Parris,	095.
	Rouane,	086. $\frac{2}{3}$.
	Sivell, &c.	135. vares.
	The Isles, &c.	103. $\frac{1}{3}$
	Venice,	180, braces.
	Lucques,	200.
	Florence,	204. $\frac{1}{6}$.
	Millan,	230.
	Geanes,	480 $\frac{5}{6}$ paulmes.

The agreement of the measure at *Siuell, &c.* with the measures at other places.

Siuell. &c.

100 vares at Syuell doo make at	London,	74 elles.
	Andwarpe,	123. $\frac{7}{16}$.
	Nuremberge,	129.
	Franckforde, &c.	154. $\frac{5}{19}$.
	Dantzicke,	102. $\frac{7}{16}$.
	Vienne,	107. $\frac{3}{8}$.
	Lyons,	75. $\frac{1}{4}$ aulnes.
	Parris,	70. $\frac{1}{8}$.
	Rouan,	64. $\frac{1}{8}$.
	Lisheburne.	74 vares.
	The Isles of, &c.	76. $\frac{1}{2}$.
	Venice,	133. $\frac{1}{3}$. braces.
	Lucques.	148. $\frac{1}{8}$.
	Florence,	151. $\frac{5}{16}$.
	Millan,	170. $\frac{3}{8}$.
	Geanes,	356. $\frac{1}{4}$. paulmes

The agreement of the measure at the *Isles of Madere, with the measures at other places.*

Isles of Madere.

100 vares at ye Isles of Madere, dooe make at	London,	96. $\frac{2}{4}$.	elles.
	Andwarpe,	161. $\frac{1}{4}$.	
	Nuremberge,	168. $\frac{1}{4}$.	
	Franckforde, &c.	201. $\frac{1}{2}$.	
	Dantzicke,	133. $\frac{5}{6}$.	
	Vienne,	140. $\frac{1}{3}$.	
	Lyons,	98. $\frac{2}{3}$	aulnes.
	Parris,	91. $\frac{7}{8}$.	
	Rouan,	83. $\frac{5}{6}$.	
	Lisheburne,	96. $\frac{3}{4}$	vares.
	Syuell, &c.	130. $\frac{3}{5}$.	
	Venice,	174. $\frac{1}{5}$	braces.
	Lucques,	193. $\frac{1}{2}$.	
	Florence,	197. $\frac{1}{2}$.	
	Myllan.	222. $\frac{1}{1}$.	
	Geanes,	465. $\frac{2}{4}$.	palmes.

The agrement of the measure at Venice with the measure at other places.

Venice.

100 braces at Venice doo make at

London	$55\frac{1}{2}$	elles.
Andwarpe	$92\frac{1}{2}$.	
Nuremberge	$96\frac{1}{4}$.	
Franckford &c.	$115\frac{3}{4}$.	
Dantzike	$76\frac{4}{5}$.	
Vienne.	$80\frac{1}{2}$.	
Lions	$56\frac{1}{8}$	aulnes.
Parris	$52\frac{1}{4}$.	
Rouan	$48\frac{1}{8}$.	
Lishborne	$55\frac{1}{2}$	vares.
Siuell, &c.	75.	
The Isles. &c.	$57\frac{2}{5}$.	
Lucques	111	braces.
Florence	$113\frac{2}{5}$.	
Millan	$127\frac{3}{4}$.	
Geanes	$265\frac{1}{8}$	paulmes.

The agremēt of the measures at Lucques with the measures at other places.

Lucques.

100 braces at Lucques, doo make at	London	50 elles.
	Andwarpe	83 1/5.
	Nuremberge	76.
	Franckford &c.	104 1/6.
	Dantzicke	69 1/6.
	Vienne	72 1/2.
	Lions	50 5/6 aulnes.
	Parris	47 1/2.
	Rouan	43 1/3.
	Lishburne	50 vares.
	Siuell &c.	67 1/2.
	The Isles &c.	51 2/3.
	Venice	90 braces.
	Florence	102.
	Millan	115.
	Geanes	240 1/3 paulmes.

The agrement of the measure of *Florence with the measures at other places.*

Florence.

100 braces at Florence doo make at

London,	49. elles.
Andwarpe,	81. $\frac{3}{8}$.
Nuremberge,	85, $\frac{1}{4}$.
Franckford, &c.	102
Dantzicke,	67. $\frac{3}{4}$.
Vienne	71.
Lyons,	49. $\frac{3}{4}$. aulnes.
Parris,	46. $\frac{1}{2}$.
Rouan,	42, $\frac{2}{5}$.
Lishburne,	49, vares
Siuell. &c.	42. $\frac{2}{5}$.
The Isles. &c.	50. $\frac{3}{5}$.
Venice,	88. $\frac{1}{6}$.
Lucques,	97. $\frac{7}{8}$.
Millan,	112. $\frac{2}{5}$.
Geanes,	235. $\frac{1}{2}$. paulmes.

The agrement of the measure at *Millan* with the measures at *other places*.

Millan.

100 braces at millan, doo make at	London,	$43.\frac{2}{5}$. elles.
	Andwarpe,	$72.\frac{2}{5}$.
	Nuremberge,	$75.\frac{5}{8}$.
	Franckford, &c.	$90.\frac{1}{2}$.
	Dantzicke,	$60.\frac{1}{8}$.
	Vienne,	63.
	Lyons,	$44.\frac{1}{5}$. aulnes.
	Parris,	$41.\frac{1}{4}$.
	Rouan,	$37.\frac{2}{3}$.
	Lisbburne,	$43.\frac{2}{5}$. vares.
	Sivell, &c.	$58.\frac{2}{3}$.
	The Iles. &c.	$44.\frac{7}{8}$.
	Venice,	$78.\frac{1}{4}$. braces.
	Lucques.	$86.\frac{7}{8}$.
	Florence,	$88.\frac{3}{4}$.
	Geânes,	209. paulmes.

The agrement of the measures at *Geanes, with the measures at other places.*

Geanes.

100 paulmes at Geanes, do make at

London,	20. $\frac{3}{4}$	elles.
Andwarpe,	34. $\frac{3}{5}$.	
Nuremberge,	36. $\frac{1}{5}$.	
Franckeford, &c.	43. $\frac{1}{6}$.	
Dantzicke,	28. $\frac{3}{4}$.	
Vienne.	30. $\frac{1}{8}$.	
Lions	21. $\frac{1}{8}$	aulnes.
Parris	19. $\frac{1}{4}$.	
Rouan	18.	
Lishborne	20. $\frac{1}{4}$	vares.
Sivell, &c.	28.	
The Isles &c.	21. $\frac{2}{5}$.	
Venice,	37. $\frac{2}{5}$.	braces.
Lucques,	41. $\frac{1}{2}$.	
Florence,	42. $\frac{2}{3}$.	
Myllan.	47. $\frac{1}{4}$.	

The agreemẽt of the waightes of diuers Countries, *the one with the other beinge reduced to an Equality, and drawen into Tables, as foloweth.*

London.

100 elles at Londõ do make. at.

Andwarpe,	107. $\frac{7}{8}$.
Freckãford,	99.
Collen & Ausberge,	102. $\frac{1}{4}$.
Nuremberge,	100. $\frac{1}{8}$.
Rouan,	098.
Lyon,	118. $\frac{1}{2}$.
Parris,	102. $\frac{1}{4}$.
Diepe,	100, $\frac{1}{4}$.
Geneue,	90. $\frac{5}{8}$.
Toulouse,	122. $\frac{3}{4}$.
Rochell,	124. $\frac{7}{8}$.
Marseilles,	124. $\frac{1}{4}$.
Seuill, &c.	109. $\frac{3}{4}$.
Venice suttel waight,	166. $\frac{7}{8}$.
Venice grosse waight,	105. $\frac{3}{8}$.
Aquilla,	157. $\frac{1}{4}$.
Vienne,	89. $\frac{3}{8}$.
Preslawe,	134. $\frac{5}{8}$.
Leibzig,	101. $\frac{1}{4}$.
Dantzig,	129. $\frac{1}{4}$.
Lubeck,	97. $\frac{3}{8}$.
Barcellone,	143. $\frac{1}{2}$.
Lishburne the small waight,	99.
Geanes,	157. $\frac{1}{4}$.

The agrement of rhe waight at *Andwarpe*, with the *Waights at other places*.

Andwarpe.

100 li. waightat andwarp do make

London,	104 li.
Francforde,	91. 7/8.
Collen, &c.	94. 7/8.
Nuremberg,	93.
Rouan,	91.
Lyon,	110.
Parris,	96. 1/4.
Diepe,	93.
Geneue,	84.
Toulouse,	114.
Rochell,	116.
Marsellis,	115. 1/4.
Syuell,	101. 2/8.
Venice suttell, &c.	155.
Venice grosse, &c.	97. 3/4.
Aquila,	146.
Vienne,	83.
Preslaw,	125.
Liebsig,	094.
Dantzick,	120.
Lubecke,	90. 1/4.
Barcellone,	133. 1/4.
Lishburne, &c.	84. 1/2.
Geanes,	146.

The agrement of the waight at *Franck forde*, *withe the waights at other places*.

100 li. at Francke- forde, doo make at

	Franckforde.
London,	113. $\frac{1}{8}$.
Andwarpe,	108. $\frac{3}{4}$.
Collen, &c.	103. $\frac{1}{4}$.
Nuremberg,	102. $\frac{1}{8}$.
Rouan,	099.
Lyons,	119. $\frac{5}{8}$.
Parris,	103. $\frac{1}{4}$.
Diepe,	101. $\frac{1}{4}$.
Geneue,	91. $\frac{1}{4}$.
Toulouse,	124.
Rochell,	126. $\frac{1}{8}$.
Marseilles,	125. $\frac{1}{2}$.
Syuell,	110. $\frac{3}{4}$.
Venice suttell, &c.	168. $\frac{1}{2}$.
Venice grosse, &c.	106. $\frac{3}{8}$.
Aquila,	158. $\frac{3}{4}$.
Vienne,	090. $\frac{1}{4}$.
Breslaw,	135. $\frac{7}{8}$.
Liebzig,	102. $\frac{1}{4}$.
Dantzig,	130. $\frac{1}{2}$.
Lubecke,	098. $\frac{1}{4}$.
Barcellone,	144. $\frac{7}{8}$.
Lishburne,	100.
Geanes,	158. $\frac{1}{4}$.

The agrement of the waight at Collen, *and at ausberge, with the waight at other places.*

At Collen, and Ausberge.

London	109 $\frac{1}{2}$.
Andwarpe	105 $\frac{1}{4}$.
Franckforde	096 $\frac{3}{4}$.
Noremberge	097 $\frac{7}{8}$.
Rouan	095 $\frac{3}{4}$.
Lions	115 $\frac{7}{8}$.
Parris	100
Diepe	098
Geneue	088 $\frac{1}{2}$.
Toulouse	120.
Rochell	122 $\frac{1}{8}$.
Marseilles	121 $\frac{2}{2}$.
Seuill	107 $\frac{1}{2}$.
Venice. &c.	163 $\frac{1}{5}$.
Venice. &c.	103.
Aquila	153 $\frac{3}{4}$.
Vienne	087 $\frac{1}{4}$.
Preslaw	101.
Liebzige.	099.
Dantzige	126 $\frac{3}{8}$.
Lubecke	095 $\frac{1}{4}$.
Barcellone	140 $\frac{1}{4}$.
Lishburne	096 $\frac{3}{4}$.
Geanes	153 $\frac{3}{4}$.

100 Li. wayghte at Collen and Ausberge doe make at.

The agreement of the waight at Nu-*remberge, with the waightes at other places.*

100 li. at Nurẽberge do make at

	Nuremberge.
London,	111. $\frac{3}{4}$.
Andwarpe,	107. $\frac{1}{2}$.
Francksord,	098. $\frac{7}{8}$.
Collen, &c.	102.
Rouan,	097. $\frac{7}{8}$.
Lions,	118. $\frac{1}{4}$.
Parris,	102.
Diepe,	100. $\frac{1}{8}$.
Geneue,	090. $\frac{1}{4}$.
Toulouse,	122. $\frac{3}{8}$.
Rochell,	124. $\frac{5}{8}$.
Marcellis.	124.
Siuell,	109. $\frac{1}{2}$.
Venice. &c.	166. $\frac{5}{8}$.
Venice. &c.	105. $\frac{1}{8}$.
Aquila,	157.
Vienne,	89. $\frac{1}{4}$.
Preslawe,	134. $\frac{3}{8}$.
Liebsig,	101. $\frac{1}{8}$.
Dantzicke,	129.
Lubeck,	97. $\frac{3}{4}$.
Barcellone,	143. $\frac{1}{4}$.
Lishburne,	98. $\frac{7}{8}$.
Geanes,	157.

The agrement of the waighte at *Rouan, with the waights at other places.*

Rouan.

100 li. waight at Rouã do make, at.

London,	114. $\frac{1}{4}$.
Andwarpe,	109. $\frac{7}{8}$.
Franckeford,	101.
Collen, &c.	104. $\frac{1}{4}$.
Nuremberge,	102. $\frac{1}{8}$.
Lions,	120. $\frac{7}{8}$.
Parris,	104. $\frac{1}{4}$.
Diepe,	102. $\frac{1}{4}$.
Geneue,	92. $\frac{1}{4}$.
Toulouse,	125. $\frac{1}{4}$.
Rochell,	127. $\frac{1}{4}$.
Marcellis,	126. $\frac{3}{4}$.
Siuell,	112.
Venice, &c.	170. $\frac{1}{4}$.
Venice, &c.	107. $\frac{1}{2}$.
Aquila,	160. $\frac{1}{4}$.
Vienne.	91.
Preslaw,	137. $\frac{1}{4}$.
Liebsige,	103. $\frac{1}{4}$.
Dantzicke,	131. $\frac{7}{8}$.
Lubecke,	99. $\frac{3}{4}$.
Barcellone	146. $\frac{1}{4}$.
Lishburne,	101.
Geanes,	160. $\frac{1}{4}$.

The agreement of the waight at *Lions, with the waightes at other places.*

100 li. waight at Lyons doo make at

	Lions.
London,	94. $\frac{1}{2}$.
Andwarpe,	90. $\frac{7}{8}$.
Franckforde,	83. $\frac{1}{2}$.
Collen, &c.	86. $\frac{1}{4}$.
Nurembergе,	84. $\frac{1}{8}$.
Rouan,	82. $\frac{1}{2}$.
Parris,	86. $\frac{1}{4}$.
Diepe,	84. $\frac{1}{2}$.
Geneue,	76. $\frac{1}{4}$.
Toulouse,	103. $\frac{1}{2}$.
Rochell,	105. $\frac{1}{4}$.
Marcellis,	104. $\frac{3}{4}$.
Siuell,	92. $\frac{1}{2}$.
Venice, &c.	140. $\frac{3}{4}$.
Venice,	88. $\frac{7}{8}$.
Aquila,	132. $\frac{1}{2}$.
Vienne,	75. $\frac{1}{4}$.
Preslaw,	113, $\frac{1}{2}$.
Liebsige,	85. $\frac{1}{4}$.
Dautzicke,	109.
Lubecke,	82.
Barcellone,	121.
Lisheburne.	83. $\frac{1}{2}$.
Geanes,	132. $\frac{1}{2}$.

The agrement of the waight at Parris, with the waights at other places.

100 li. at Parris doe make at,		Parris.
	London	109 $\frac{1}{2}$.
	Andwarpe	105 $\frac{1}{4}$.
	Franckforde	96 $\frac{3}{4}$.
	Collen, &c.	102 $\frac{1}{4}$.
	Nuremberge.	97. $\frac{7}{8}$.
	Rouan	95 $\frac{3}{4}$.
	Lions	115 $\frac{7}{8}$.
	Diepe	98
	Geneue	88 $\frac{1}{4}$.
	Toulouse	120.
	Rochell	122 $\frac{1}{8}$.
	Marseilles	121 $\frac{1}{2}$.
	Seuill	107 $\frac{1}{4}$.
	Venice. &c.	164.
	Venice. &c.	103.
	Aquila	153 $\frac{3}{4}$.
	Vienne	87 $\frac{1}{4}$.
	Preslaw	131. $\frac{1}{2}$.
	Liebzige.	94. $\frac{1}{8}$.
	Dantzige	126 $\frac{1}{4}$.
	Lubecke	95 $\frac{1}{8}$.
	Barcellone	140 $\frac{5}{8}$.
	Lishburne	96 $\frac{3}{4}$.
	Geanes	153 $\frac{3}{4}$.

The agreement of the waight at *Diepe*, with the waights at other *places*.

Diepe.

100 li. waight at Diepe do make at		
	London,	111. $\frac{1}{2}$.
	Andwarpe,	107. $\frac{1}{4}$.
	Franckford,	98. $\frac{3}{4}$.
	Collen, &c.	102.
	Nuremberge,	97. $\frac{7}{8}$.
	Rouan,	97. $\frac{3}{4}$.
	Lyons,	118. $\frac{1}{8}$.
	Parris,	102.
	Geneue,	90. $\frac{1}{8}$.
	Toulouse,	122. $\frac{3}{8}$.
	Rochell,	124. $\frac{1}{2}$.
	Marsellis,	123. $\frac{7}{8}$.
	Syuell,	109. $\frac{3}{8}$.
	Venice suttel, &c.	166. $\frac{3}{8}$.
	Venice grosse, &c.	105.
	Aquila,	156. $\frac{3}{4}$.
	Vienne,	89. $\frac{1}{8}$.
	Preslaw,	134. $\frac{1}{4}$.
	Liebsig,	101.
	Dantzicke,	128. $\frac{3}{4}$.
	Lubecke,	97. $\frac{1}{8}$.
	Barcellone,	143. $\frac{1}{8}$.
	Lishburne,	98. $\frac{3}{4}$.
	Geanes,	156. $\frac{3}{4}$.

The agreement of the waight at *Geneue, with the waightes at other places.*

Geneue.

100 li. at Geneue, doo make at

London,	123.$\frac{3}{4}$.
Andwarpe,	119.$\frac{1}{8}$.
Franckford.&c.	109.$\frac{1}{2}$.
Collen,&c.	113.$\frac{1}{8}$.
Nuremberge,	110.$\frac{3}{4}$.
Rouan,	108.$\frac{3}{8}$.
Lyons,	131.$\frac{7}{8}$.
Parris,	113.$\frac{1}{8}$.
Diepe,	98.
Toulonse,	135.$\frac{3}{4}$.
Rochell,	138.$\frac{1}{8}$.
Marcellis,	137.$\frac{3}{4}$.
Seuill,	121.$\frac{3}{8}$.
Venice grosse,&c.	184.$\frac{1}{2}$.
Venice suttell,&c.	116.$\frac{1}{2}$.
Aquila,	174.
Vienne,	98.$\frac{7}{8}$.
Preslaw,	148.$\frac{7}{8}$.
Liebsig,	112.
Dantzicke,	143.
Lubeck,	107.$\frac{1}{2}$.
Barsellone,	158.$\frac{3}{4}$.
Lisheburne,	109.$\frac{1}{2}$.
Geanes,	174.

The agrement of rhe waight at *Toulouse, with the waightes at other places.*

Toulouse.

100 li. waightat toulouse do make		
	London,	91. 1/4.
	Andwarpe,	87. 1/2.
	Francforde,	80. 5/8.
	Collen, &c.	83. 1/4.
	Nuremberg.	81. 7/8.
	Rouan,	79. 3/4.
	Lyons,	96. 1/2.
	Parris,	83. 1/4.
	Diepe,	81. 1/2.
	Geneue,	73. 5/8.
	Rochell,	101. 1/2.
	Marcellis,	101. 1/8.
	Syuell,	89. 1/8.
	Uenice sutrell, &c.	135. 7/8.
	Uenice grosse, &c.	81. 5/8.
	Aquila,	128.
	Uienne,	72. 1/4.
	Breslaw,	109. 5/8.
	Liebsig,	82. 5/8.
	Dantzick,	105. 1/4.
	Lubecke,	79. 1/4.
	Barcellone,	116. 7/8.
	Lishburne, &c.	80. 5/8.
	Geanes,	126. 1/4.

The agremẽt of the waight at Rochell with the waightes at other places.

Rochell.

100 li. waight at Rochell doe make at

London	89. 5/8.
Andwarpe	86. 1/8.
Franckford &c.	79. 1/4.
Collen. &c.	81. 7/8.
Nuremberge	80. 1/8.
Rouan	78. 1/4.
Lions,	94. 7/8.
Parris	81 7/8.
Diepe,	80. 1/4.
Geneue,	72. 1/4.
Toulouse,	98. 1/4.
Marcellis,	99. 1/2.
Siuill,	87. 7/8.
Venice, &c.	133. 5/8.
Venice &c.	84. 3/8.
Aquila,	125. 7/8.
Vienne	71. 1/2.
Preslawe,	107. 3/4.
Liebsige,	81. 1/8.
Dantzicke,	103. 1/2.
Lubecke,	77. 7/8.
Barcellone,	114. 7/8.
Lishburne	79. 1/4.
Geanes,	125. 7/8.

The agrement of the waight at Marsellis with the waightes at other places.

100 li. waighte at Marsellis doe make at

	Marsellis.
London,	88.$\frac{1}{2}$.
Andwarpe,	86.$\frac{1}{2}$.
Franckford.	79.$\frac{5}{8}$.
Collen, &c.	82.$\frac{1}{4}$
Nuremberge,	80.$\frac{1}{2}$.
Rouan,	78.$\frac{7}{8}$.
Lions,	95.$\frac{1}{4}$.
Parris,	82.$\frac{1}{4}$.
Diepe,	80.$\frac{5}{8}$.
Geneue,	72.$\frac{1}{2}$.
Toulouse	98.$\frac{3}{4}$.
Rochell,	100.$\frac{1}{2}$.
Sinell,	88.$\frac{1}{4}$.
Venice, &c.	134.$\frac{1}{4}$.
Venice, &c.	84.$\frac{3}{4}$
Aquila,	126.$\frac{1}{2}$.
Vienne.	71.$\frac{7}{8}$.
Breslaw,	108.$\frac{1}{4}$.
Liebsige	81.$\frac{3}{8}$.
Dantizke.	104.
Lubecke,	78.$\frac{3}{8}$.
Barcellone,	115.
Lishborne,	79.$\frac{5}{8}$.
Geanes,	126.$\frac{1}{2}$.

The agreement of the waight at *Siuill, with the waighte at other places.*

		Siuill.
100 li. waight at Siuill do make at	London,	102.
	Andwarpe,	98. 1/2.
	Franckford,	79. 5/8.
	Collen, &c.	93. 1/8.
	Nuremberge,	91. 1/8.
	Rouan,	89. 1/4.
	Lions,	107. 7/8.
	Parris	93. 1/8.
	Diepe,	91. 1/4.
	Geneue,	82. 1/4.
	Toulouse,	111. 3/4.
	Rochell,	113. 3/4.
	Marcellis.	113. 3/4.
	Venice, &c.	152.
	Venice, &c.	96.
	Aquila,	143. 1/4.
	Vienne,	81. 3/8.
	Preslaw,	122. 5/8.
	Liebsige,	92. 1/4.
	Dantzicke,	117. 3/4.
	Lubecke,	88. 5/8.
	Barcellone,	130. 3/4.
	Lishburne,	90. 1/8.
	Geanes,	143. 1/4.

The agrement of the waight at *Venice suttell, with the waightes at other places.*

Venice suttell waight.

100 li. waight suttell at Venice dothe make at

London,	67.
Andwarpe,	64. $\frac{1}{2}$.
Franckford,	59. $\frac{1}{4}$.
Collen, &c.	61 $\frac{1}{4}$.
Nuremberge,	60.
Rouan,	58. $\frac{5}{8}$.
Lyons,	71.
Parris,	61. $\frac{1}{4}$.
Diepe,	60.
Geneue,	54. $\frac{1}{8}$.
Toulouse,	73. $\frac{1}{2}$.
Rochell,	74. $\frac{3}{4}$.
Marcellis,	74. $\frac{3}{8}$.
Siuell,	65. $\frac{3}{4}$.
Venice grosse, &c.	63. $\frac{1}{8}$.
Aquila,	94. $\frac{1}{8}$.
Vienne	53. $\frac{1}{2}$.
Pres lawe,	80. $\frac{3}{4}$.
Liebsicke,	60. $\frac{5}{8}$.
Dantzicke,	77. $\frac{3}{8}$.
Lubecke,	58. $\frac{1}{4}$.
Barsellone,	86.
Lishburne,	59. $\frac{1}{4}$.
Geanes,	94. $\frac{1}{8}$.

The agreemēt of the grosse waighte *at Venice, with the weightes at other places.*

Venice, grosse weight.

100 li. grosse waight at Venice, doo make at

London,	106. $\frac{1}{4}$.
Andwarpe,	102. $\frac{1}{8}$.
Frāckford,	93. $\frac{7}{8}$.
Collen & Ausberge,	97.
Nuremberge,	95.
Rouan,	93.
Lions	112. $\frac{3}{8}$.
Parris,	97.
Diepe,	95. $\frac{1}{8}$.
Geneue,	85. $\frac{1}{4}$.
Toulouse,	116. $\frac{3}{8}$.
Rochell,	118. $\frac{1}{2}$.
Marsellis,	117. $\frac{7}{8}$.
Seuill, &c.	104. $\frac{1}{8}$.
Venice suttel waight,	158. $\frac{1}{4}$.
Aquilla,	149. $\frac{1}{8}$.
Vienne,	84. $\frac{3}{4}$.
Preslawe,	127. $\frac{3}{4}$.
Leibzig,	96.
Dantzig,	122. $\frac{5}{8}$.
Lubeck,	92. $\frac{3}{8}$.
Barcellone,	136. $\frac{1}{8}$.
Lishburne the small waight,	93. $\frac{7}{8}$.
Geanes,	149. $\frac{1}{8}$.

The agrement of the waight at *Aquila*, with the weightes at other places.

Aquila.

100 li. waight at Aquila, doe make at

London,	71. $\frac{1}{4}$.
Andwarpe,	68. $\frac{3}{8}$.
Franckford,	62. $\frac{7}{8}$.
Collen, &c.	65.
Nuremberg,	63. $\frac{5}{8}$.
Rouan,	62. $\frac{1}{4}$.
Lyons,	75. $\frac{1}{4}$.
Parris,	65.
Diepe,	63. $\frac{1}{8}$.
Geneue,	57. $\frac{3}{8}$.
Toulouse,	78.
Rochell,	79. $\frac{3}{8}$.
Marcellis,	79.
Siuell,	69. $\frac{3}{4}$.
Venice suttell, &c.	106.
Venice grosse, &c.	67.
Vienne,	56. $\frac{3}{4}$.
Preslaw,	85. $\frac{3}{4}$.
Liebsig,	64. $\frac{1}{4}$.
Dantzicke,	82. $\frac{1}{8}$.
Lubecke,	61. $\frac{7}{8}$.
Barcellone,	91. $\frac{1}{4}$.
Lishburne,	62. $\frac{7}{8}$.
Geanes,	100.

The agrement of the waight at *Vienne*, with the waightes *at other places*.

Vienne.

100 li. at Vienne, doo make at	London,	125. $\frac{1}{4}$.
	Andwarpe,	120. $\frac{1}{4}$.
	Franckforde,	110, $\frac{3}{4}$.
	Collen, &c.	114. $\frac{3}{6}$.
	Nuremberg,	112.
	Rouan,	109. $\frac{5}{8}$.
	Lyons,	132. $\frac{1}{2}$.
	Parris,	114. $\frac{3}{8}$.
	Diepe,	112. $\frac{1}{8}$.
	Geneue,	101. $\frac{1}{8}$.
	Toulouse,	137. $\frac{1}{4}$.
	Rochell,	139. $\frac{5}{8}$.
	Marcellis,	139.
	Syuell,	122. $\frac{3}{4}$.
	Venice suttell, &c.	186. $\frac{5}{8}$.
	Venice grosse, &c.	117. $\frac{7}{8}$.
	Aquila,	175. $\frac{7}{8}$.
	Preslaw,	150. $\frac{5}{8}$.
	Liebzig,	113. $\frac{1}{4}$.
	Dantzig,	144. $\frac{1}{2}$.
	Lubecke,	108. $\frac{7}{8}$.
	Barcellone,	160. $\frac{1}{2}$.
	Lishburne,	110. $\frac{3}{4}$.
	Geanes,	175. $\frac{7}{8}$.

The agreement of the waight at *Preslawe, with the waightes at other places.*

Preslawe.

100 li. waight at Preslaw, doo make at

London,	83. 1/8.
Andwarpe,	79. 7/8.
Franckforde,	73. 1/2.
Collen, &c.	75. 7/8.
Nuremberge,	74. 1/4.
Rouan,	72. 3/4.
Lyons,	88.
Parris,	75. 7/8.
Diepe,	74. 3/8.
Geneue,	67. 1/8.
Toulouse,	91. 1/8.
Rochell,	92. 2/4.
Marcellis,	92. 1/4.
Syuell,	81. 1/2.
Venice suttell, &c.	123. 7/8.
Venice grosse, &c.	78. 1/4.
Aquila,	116. 3/4.
Vienne,	66. 3/8.
Liebsicke,	75. 1/8.
Dantzicke,	96. 2/8.
Lubecke,	72. 1/4.
Barcellone,	106. 1/2.
Lisheburne,	73. 1/2.
Geanes,	116. 3/4.

The agreement of the weight at *Liebsick*, with the weightes at *other places*.

Liebsicke.

100 li. waight at Liebsig, do make at	London,	110. $\frac{1}{2}$.
	Andwarpe,	106. $\frac{1}{4}$.
	Franckeford,	97. $\frac{3}{4}$.
	Collen, &c.	100. $\frac{7}{8}$.
	Nuremberge,	98. $\frac{7}{8}$.
	Rouan,	96. $\frac{3}{4}$.
	Lions,	117.
	Parris,	100. $\frac{7}{8}$.
	Diepe,	99.
	Geneue,	89. $\frac{1}{4}$.
	Toulouse,	121. $\frac{1}{8}$.
	Rochell,	123. $\frac{1}{4}$.
	Marcellis,	122. $\frac{5}{8}$.
	Seuill,	108. $\frac{3}{8}$.
	Venice suttell, &c.	164. $\frac{3}{4}$.
	Venice grosse, &c.	104.
	Aquila,	155. $\frac{1}{4}$.
	Vienne,	88. $\frac{1}{4}$.
	Breslaw,	132. $\frac{7}{8}$.
	Dantzicke,	127. $\frac{5}{8}$.
	Lubecke,	96. $\frac{1}{8}$.
	Barcellone,	141. $\frac{5}{8}$.
	Lishburne,	97. $\frac{3}{4}$.
	Geanes,	155. $\frac{1}{4}$

The second parte of this booke treateth of *Fractions or broken numbers*.

The first chapter sheweth what a fraction or broken number is. Fol. 49

The second chapter teacheth all kinds of reduction in fractions. Fol. 50.

The third chap. treateth of abbreuiation of fractions. Fol, 56. 57

The 4 chapter teacheth Addicion in fractions. Fol. 60.

The 5 Chapter sheweth of Subtraction in fractions. Fol. 64

The 6 chapter teacheth of Multiplication in fractions. Fol. 68. 69

The 7 chapter sheweth how you may diuide any sum in fractions. Fol. 71 72

The 8 chapter treateth of Duplation, Triplation, & Quadruplation in fractions. Fol. 75. 77

The 9 chapter sheweth all the profes of fractions, or broken nūbers. fo. 77

The 10 chap. teacheth how to worke diuers questions of reduction of Addition, of Subtraction of Multiplication, and of Diuision in broken numbers. Fol. 79.

The third part of this booke treateth *of all manner of necessary questions whiche are vsed in the trade of Merchandise.*

The first chapter teacheth all sortes of rules of practise, called breife rules. Fol. 87.

The 2 Chapter teacheth the rules of three, composed, beinge 4 of them in number. Fol. 109.

The 3 chapter treateth of diuers questions of the trade of merchandise, and of ẏ rule of three in fractions. fo. 112.

The 4 chapter is of questions of gaines, and losses in the trade of Merchandise, Fol. 123.

The 5 chapter teacheth diuers questions, of the reducinge of breadethes and lengthes of Tapistryes, into elles square. Fol. 128.

The 6 chapter sheweth how to reduce the paulmes of Geanes, into yardes. &c. Fol. 131.

The 7 Chapter teacheth certaine questions of merchandise, sold by waight with notable breife rules to doo the same. Fo. 132.

The 8 chapter teacheth diuers questions of the trade of merchandise, with tares and alowances vpon the same. Fol. 135. 136

The 9 Chapter teacheth howe to doo diuers questions by the double rule of three, that is by the Rule of three, at twise, or thrise, wherin are notable examples, and some wrought by ẏ rule of three composed. Fol. 138.

The 10 chapter treateth of the Rule of felowship or partnershipe, and also the rule of partnership betwene maisters and their factours, wherein is taught very necessary questions. Fol. 145

The 11 Chapter, teacheth diuers and notable questions for to barter wares for wares, & also to barter wares, for part money and ẏ rest wares. fo. 158

The 12 chap. treateth of the exchanging of money, from one place to another, by sundry examples. Fol, 166. 167

The 13 Chapter teacheth diuers and sundrye questions of the rule of Alligation, the which rule is distincte into

2 partes

2 partes wᵗ examples on both. fo. 169
The 14 chapter teacheth the Rules of false positions. Fol. 181.
The 15 chap. treateth of diuers questions extraordinary. Fol. 189.
The 16 chap treateth of diuers sportes and pastimes done by number. Fol. 197.

FINIS.

The agrement of the Measures and waights, of diuers places in Europa the one with the other. fol. 200

The agrement of the waighte at *Dantzike, with the waightes at other places.*

		Dantzicke.
100 li. waight at Dantzig do make, at	London,	86. $\frac{5}{8}$.
	Andwarpe,	83. $\frac{1}{4}$.
	Franckford,	76. $\frac{1}{2}$.
	Collen, &c.	79.
	Nuremberge,	77. $\frac{3}{8}$.
	Rouan,	75. $\frac{3}{4}$.
	Lions,	91. $\frac{5}{8}$.
	Parris,	79.
	Diepe,	77. $\frac{1}{2}$.
	Geneue,	69. $\frac{7}{8}$.
	Toulouse,	94. $\frac{7}{8}$.
	Rochell,	96. $\frac{1}{2}$.
	Marcellis,	96. $\frac{1}{8}$.
	Syuell,	84. $\frac{7}{8}$.
	Venice suttell, &c.	129.
	Venice grosse, &c.	81. $\frac{1}{2}$.
	Aquila,	121. $\frac{5}{8}$.
	Vienne,	69. $\frac{1}{2}$.
	Przellaw,	104. $\frac{1}{8}$.
	Liebsige,	78. $\frac{1}{4}$.
	Lubeck,	75. $\frac{3}{8}$.
	Barcellone,	111.
	Lishburne,	76. $\frac{1}{2}$.
	Geanes,	121. $\frac{5}{8}$.

The agreement of the weight at *Lubeck*, with the weightes at *other places*.

Lubecke.

100 li. waight at Lubecke do make at

London,	115.
Andwarpe,	110. $\frac{1}{2}$.
Franckford,	101. $\frac{5}{8}$.
Collen, &c.	105.
Nutemberge	102. $\frac{3}{4}$.
Rouan,	100. $\frac{5}{8}$.
Lions,	121. $\frac{5}{8}$.
Parris,	105.
Diepe,	102. $\frac{7}{8}$.
Geneue,	92. $\frac{3}{4}$.
Toulouse,	126.
Rochell,	128. $\frac{1}{4}$.
Marcellis.	127. $\frac{1}{2}$.
Siuell,	114. $\frac{5}{8}$.
Venice suttell, &c.	171. $\frac{1}{4}$.
Venice grosse, &c.	108. $\frac{1}{8}$.
Aquila,	161. $\frac{1}{2}$.
Vienne,	91. $\frac{3}{4}$.
Preslawe,	138. $\frac{1}{4}$.
Liebsig,	103. $\frac{7}{8}$.
Dantzicke,	132. $\frac{5}{8}$.
Barcellone,	147. $\frac{1}{4}$.
Lishburne,	101. $\frac{5}{8}$.
Geanes,	161. $\frac{1}{2}$.

The agrement of the waight at Bar- *cellon with the waightes at other places.*

100 li. waighte at Barcellone do make at

	Barcellone.
London,	78.
Andwarpe,	75.
Franckford.	68. 1/8.
Collen, &c.	71. 1/4
Nuremberge,	69. 3/4.
Rouan,	68. 1/4.
Lions,	82. 1/2.
Parris,	71. 1/4.
Diepe,	69. 3/4.
Geneue,	62. 7/8.
Toulouse	85. 1/2.
Rochell,	87.
Marcellis,	86. 1/2.
Siuell,	76. 3/8.
Venicesuttel, &c.	116. 1/4.
Venice grosse, &c.	73. 3/8.
Aquila,	109. 1/2.
Vienne.	62. 7/8.
Breslaw,	93. 3/4.
Lieblige	70. 1/2.
Dantizke,	90.
Lubecke,	67. 3/4.
Lishborne,	68. 5/8.
Geanes,	109. 1/2.

The agreement of the waight at Lishburne, with the waights at other places.

Lishburne.

100 li. waight at lishburne doe make at

London,	113. $\frac{1}{8}$.
Andwarpe,	108, $\frac{3}{4}$.
Franckford&c.	100.
Collen.&c.	103. $\frac{1}{4}$.
Nuremberge	102. $\frac{1}{8}$.
Rouan	99.
Lions,	119. $\frac{5}{8}$.
Parris	103. $\frac{1}{4}$.
Diepe,	101. $\frac{1}{4}$.
Geneue,	91. $\frac{1}{4}$.
Toulouse,	124.
Rochell,	126. $\frac{1}{8}$.
Marcellis,	125. $\frac{1}{2}$.
Siuell,	110 $\frac{3}{4}$.
Venice suttell,&c.	168. $\frac{1}{2}$.
Venice grosse,&c.	106. $\frac{3}{8}$.
Aquila,	158. $\frac{3}{4}$.
Vienne	90. $\frac{1}{4}$.
Preslawe,	135. $\frac{7}{8}$.
Liebsige,	102. $\frac{1}{4}$.
Dantzicke,	130. $\frac{1}{2}$.
Lubecke,	98. $\frac{1}{4}$.
Barcellone,	144. $\frac{7}{8}$.
Geanes,	158. $\frac{3}{4}$.

The agremẽt of the waight at Geanes with the waightes at other places.

100 li. waighte at Geanes doo make at

Geanes.	
London,	71. $\frac{1}{4}$.
Andwarpe,	68. $\frac{5}{8}$.
Franckford,	62. $\frac{7}{8}$.
Collen, &c.	65.
Nuremberg,	63. $\frac{5}{8}$.
Rouan,	62. $\frac{1}{4}$.
Lyons,	75. $\frac{1}{4}$.
Parris,	65.
Diepe,	63. $\frac{1}{8}$.
Geneue,	57. $\frac{3}{8}$.
Toulouse,	78.
Rochell,	79. $\frac{3}{8}$.
Marcellis,	79.
Siuell,	69. $\frac{3}{4}$.
Venice suttell, &c.	106.
Venice grosse, &c.	67.
Aquila,	100.
Vienne,	56. $\frac{3}{4}$.
Preslaw	85. $\frac{3}{4}$.
Liebsig,	64. $\frac{1}{4}$.
Dantzicke,	82. $\frac{1}{8}$.
Lubecke,	61. $\frac{7}{8}$.
Barcellone,	91. $\frac{1}{4}$.
Lishburne,	62. $\frac{7}{8}$.

Faultes escaped in the printinge of this booke, whiche are to be corrected, before you beginne to reade any parte of the same.

The first number signifieth the leafe. The seconde representeth the page. And the thirde betokeneth the line.

fol.	pa.	line.	Faultes in the first parte.	Corrected.
3	2	2	the ligure	the fourth figure
4	1	3	pricke ouer	pricke is ouer
19	2	4	wherby	whereby
22	2	2	yf in my	yf in youre
25	1	1	conteined	4, is conteyned
38	2	21	that hde	that he
39	1	25	the thirde	in the thirde
43	1	8	42 by 3,	42 by 2,
46	1	19	1958,	105, $\frac{3}{25}$.
49	2	2	they present	they represent
53	1	13	4,4 and by	4, and 4 by
55	1	9	abbreuied 10	abbreuied by 10
63	2	13	$\begin{matrix}3\\3\end{matrix} \overset{7}{\underset{6}{\times}} \frac{1}{2}$	$\frac{2}{3} \overset{5}{\underset{6}{\times}} \frac{1}{2}$
67	1	23	finde $\frac{47}{8}$	finde $\frac{74}{8}$
		24	$\frac{41}{1}$	$\frac{41}{2}$
71	1	3	86	$86\frac{2}{5}$
		7	$85\frac{2}{5}$	$86\frac{2}{5}$

80	2	14	and $\frac{1}{4}$	and $\frac{4}{9}$
84	2	17	210	219
89	2	16	$\frac{1}{3}$ of 59	$\frac{1}{2}$ of 59
98	1	24	tfor 2 s̄.ake	for 2 s̄.take
105	1	17	185 li. 18 s̄. 6 d̄.	185 li. 14 s̄. 6 d̄.
107	1	11	47840 s̄.	47840 d̄.
113	1	2	are elles	are 18 elles
		11	18, number	number 18,
118	2	14	14 $\frac{4}{1}$	14 $\frac{1}{4}$
120	1	2	3 s̄. 2 d̄.	3 s̄. 4 d̄.
121	1	1	number 6	numbers
		12	thus the 1- 8 elles	thus the 18 elles
127	1	17	of 10 s̄.	of 10 d̄.
141	1	20	moncehes $\frac{5}{9}$	monethes $\frac{5}{6}$
142	2	15	is worthe	whiche is worthe
147	2	21	taketh	he taketh
167	1	10	3 s̄.	3 d̄.
172	1	6	7 ounc.	wilbe 7 ounces
176	1	6	giue 18,	giue 84,
180	1	12	karetts before	karats as before
181	1	23	ſhall finde,	ſhall finde howe muche he ſhal buy of euery ſorte.
	2	13	The 12 Chapter	The 14 Chapter
185	1	19	whiche the error	with the error
189	1	12	he that	that he

FINIS.

Decrevi non [illegible]

¶ Imprinted at London
by Thomas Purfoote, dwel-
ling in Paules Church yarde
at the signe of the Lucres.

[illegible] ...ctis producere . Aestiva sermone benigno tendere noctem

In stulto numen. Quo mi fortunas si non conceditur uti?
Omnes avari sunt insani. Parcus ob haeredis curam nimiumque severus
Assidet insano,
Quid non Ebrietas designat? operta recludit,
Vini vis. Spes iubet esse ratas: in praelia trudit inermes
Sollicitis animis onus eximit: Addocet artes
Faecundi calices quem non fecere disertum?
Contracta quem non in paupertate solutum?

Inconsultantes constantibus ne conveniant. Ne fidos inter amicos
Sit qui dicta fores eliminet ut coeat par
Iungaturque pari .